SONY

DATA PROJECTOR

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

PROTOCOL MANUAL 1st Edition (Revised 3)

⚠警告

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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

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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.

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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

START	D0	D1	D2	D3	D4	D5	D6	D7	STOP
BIT	(LSB)							(MSB)	BIT

Other than above

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

START	D0	D1	D2	D3	D4	D5	D6	D7	PARITY	STOP
ВІТ	(LSB)							(MSB)	(EVEN)	ВІТ

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	Reception in	Reception in the Master side
the Master side	the Master side	(With Data)

В0	START CODE : 0 × A9							
B1	ITEM NUMBER	ACK / NAK	ITEM NUMBER					
B2	ITEM NUMBER	ACK / NAK	ITEM NOMBER					
ВЗ	SET / GET	ACK	REPLY					
B4	DATA	DUMMY DATA	DATA					
B5	DATA	DOMMY DATA	DATA					
В6	CHECK SUM							
В7	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>

$0 \times A9$	1010	1001	$0 \times A9$	1010	1001
$0 \times A9$	1010	1001	$0 \times 9A$	1001	1010
Answer	1010	1001	Answer	1011	1011
		$0 \times A9$			$0 \times BB$

B7 END CODE

Common in the all FORMAT

2-3. Block Format

Transmission from the Master side

Data transmission to the Projector

В0	START CODE
B1	ITEM NUMBER
B2	ITEM NUMBER
ВЗ	SET / GET
B4	DATA
B5	DATA
В6	CHECK SUM
B7	END CODE

Start of Command

Set the Data Category Value desired. Refer to the Appendix Table 1 for details.

SET: 0 x 00 (Set data) GET: 0 x 01 (Get data)

SET: Data to be set (Refer to the Appendix Table 2) GET: Unused. Set Dummy data $[0 \times 00, 0 \times 00]$

Check Sum

End of Command

Reception in the Master side

Receive results of the data transmission from the Projector.

B0	START CODE
B1	ACK / NAK
B2	ACK / NAK
ВЗ	ACK
B4	DUMANAY DATA
B5	DUMMY DATA
В6	CHECK SUM
B7	END CODE

Start of Command

Results correspond with the data transmission Refer to the Appendix Table 3 for the data in detail.

0 x 03]

Express Reply data either of ACK, or NAK

This data does not mean any senses. Dummy Data [0 x 00, 0 x 00] is stored.

Check Sum

End of Command

Reception in the Master side (With Data)

Receive data from the Projector

В0	START CODE
B1	ITEM NUMBER
B2	ITEM NUMBER
ВЗ	REPLY
B4	DATA
B5	DATA
В6	CHECK SUM
B7	END CODE

Start of Command

Data to acquire Refer to the Appendix Table 1 in detail.

[0 x 02]

Express data to be Reply data

Received data

Refer to the Appendix Table 2 in detail.

Check Sum

End of Command

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

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>					
	Item Number			Data		Remarks
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>			<table 2=""></table>			
ľ	Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	1	
Status Error	01h	01h	No Error	00h	00h	Get only	
			Lamp Error	00h	01h	1	
			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-l	FFFh*1	1	
ROM Version	01h	1Dh	MAIN ROM Version	0000h-l	FFFh*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.

^{*5} Valid only for VPL-EX3.

<table 3=""></table>							
Ite	em Number	Data					
Iltem	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.

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^{*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.

Appendix

VPL-ES4/EX4

<7	Table 1>			<table 2:<="" th=""><th>></th><th></th></table>	>	
Iter	m Number			Data		Remarks
Item name	name Upper byte Lower byte		Item name	Upper byte	Lower byte	1
			Video	00h	00h	Set/Get
Input	00h	01h	S-Video	00h	01h	
Input	0011	0111	Input-A	00h	02h	1
			Input-B *5	00h	03h	1
			Dynamic	00h	00h	7
			Standard	00h	01h	1
			Natural	00h	02h	1
Picture Mode	00h	02h	Game	00h	03h	1
			Living	00h	04h	1
			Cinema	00h	05h	1
			Presentation	00h	06h	1
Contrast	00h	10h	Set Value	00h	00h - 64h (0 - 100)	1
Brightness	00h	11h	Set Value	00h	00h - 64h (0 - 100)	1
Color	00h	12h	Set Value	00h	00h - 64h (0 - 100)	1
Hue	00h	13h	Set Value	00h	00h - 64h (0 - 100)	1
Sharpness	00h	14h	Set Value	00h	00h - 64h (0 - 100)	1
Volume	00h	16h	Set Value	00h	00h - 64h (0 - 100)	1
	00h	17h	High	00h	00h	1
Color Temp			Middle	00h	01h	1
·			Low	00h	02h	1
			Off	00h	00h	1
DDE	00h	18h	Progressive	00h	01h	1
			Film	00h	02h	
\\\\':- -\\\\ -	001-	001-	Off	00h	00h	1
Wide Mode	00h	20h	On	00h	01h	
Coop Copy	00h	016	Off	00h	00h	
Scan Conv	00h	21h	On	00h	01h	
Diet Mestinen	001-	001-	Off	00h	00h	1
PictureMuting	00h	30h	On	00h	01h	
A ali a N.A ti . a	001-	045	Off	00h	00h	
AudioMuting	00h	31h	On	00h	01h	1
			Auto	00h	00h	1
Input A Circal C-1	004	204	Computer	00h	01h	1
Input-A Signal Sel	00h	32h	Component	00h	02h	1
			Video GBR	00h	03h	1
Lawan Mad	001-	401-	High	00h	00h	1
Lamp Mode	00h	40h	Standard	00h	01h	1

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<1	Table 1>							
Iter	n Number			Data	Data			
Item name	Upper byte	Lower byte	Item name	Upper byte	Lower byte			
				No Error	00h	00h	Get	
			Lamp Error	00h	01h			
Status Error	01h	01h	Fan Error	00h	02h			
			Cover Error	00h	04h			
			Temp Error	00h	08h			
			Stanby	00h	00h			
	01h				Start Up Lamp	00h	02h	
			Power On	00h	03h			
Status Power		02h	Cooling1	00h	04h			
Otatus i Owei		0211	Cooling2	00h	05h			
			Saving Cooling1	00h	06h			
			Saving Cooling2	00h	07h			
			Saving Stanby	00h	08h			
Lamp Timer	01h	13h	Lamp Use Time	000	00h - FFFFh *1			
ROM Version	01h	1Dh	MAIN ROM Version	0000h - FFFFh *2				
Status Security *3	01h	1Fh	Disable	00h	00h			
Status Security	0111	11711	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.

^{*5} Valid only for VPL-EX4.

<table 3=""></table>							
Ite	m Number	Da	ta				
Iltem	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.

^{*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.

Appendix

VPL-EX5/EX50/EX5U/EW5

<	Table 1>			<table 2:<="" th=""><th>></th><th></th></table>	>						
Ite	m Number			Data		Remarks					
Item name	e Upper byte Lower byte		Item name	Upper byte	Lower byte						
			Video	00h	00h	Set/Get					
Input	00h	01h	S-Video	00h	01h	1					
Input	0011	0111	Input-A	00h	02h	1					
			Input-B *5	00h	03h	1					
			Dynamic	00h	00h	1					
			Standard	00h	01h	1					
			Game	00h	03h	1					
Picture Mode	00h	02h	Living	00h	04h						
			Cinema	00h	05h						
			Presentation	00h	06h						
Contrast	00h	10h	Set Value	00h	00h - 64h (0 - 100)	1					
Brightness	00h	11h	Set Value	00h	00h - 64h (0 - 100)	1					
Color	00h	12h	Set Value	00h	00h - 64h (0 - 100)	1					
Hue	00h	13h	Set Value	00h	00h - 64h (0 - 100)	1					
Sharpness	00h	14h	Set Value	00h	00h - 64h (0 - 100)	1					
Volume	00h	16h	Set Value	00h	00h - 64h (0 - 100)	1					
	00h							High	00h	00h	1
Color Temp		17h	Middle	00h	01h						
			Low	00h	02h	1					
	00h	18h	Off	00h	00h						
DDE			Progressive	00h	01h						
			Film	00h	02h						
			Normal	00h	01h						
			Zoom	00h	03h						
			Full1	00h	07h						
Aspect	00h	20h	Full2	00h	08h						
			Wide zoom	00h	02h						
			4:3	00h	09h						
			16:9	00h	0Ah						
PictureMuting	00h	30h	Off	00h	00h						
1 icture wating	0011	3011	On	00h	01h						
AudioMuting	00h	31h	Off	00h	00h						
Addictividing	0011	3111	On	00h	01h						
			Auto	00h	00h						
Input-A Signal Sel	00h	32h	Computer	00h	01h						
input / Olynai dei	3011	0211	Component	00h	02h						
			Video GBR	00h	03h						
Lamp Mode*5	00h	40h	High	00h	00h						
Zamp wood	00.1	1011	Standard	00h	01h						

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<7	Table 1>								
Iter	n Number			Remarks					
Item name	Upper byte	Lower byte	Item name	Upper byte	Lower byte				
						No Error	00h	00h	Get
			Lamp Error	00h	01h				
Status Error	01h	01h	Fan Error	00h	02h				
			Cover Error	00h	04h				
			Temp Error	00h	08h				
			Stanby	00h	00h				
	01h		Start Up Lamp	00h	02h				
			Power On	00h	03h				
Status Power		02h	Cooling1	00h	04h				
Status i Owei		0211	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				
Status Security	0111	11-11	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.

^{*5} Valid only for VPL-EX50/EW5.

<table 3=""></table>							
Ite	m Number	Da	ta				
Iltem	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.

^{*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.

List of SIRCS CODE

(1) 15BIT Category

<Table 4>

	×o	1x	22	3x	4x	2×	×9	×
Š Š			HUE + RPLISH (
×			HUE HUE S + - PURPLISH GREENISH					
x x		VOLUME + UP	SHARPNESS + SHARP					
x3		VOLUME VOLUME + - DOWN	SHARPNESS SHARPNESS + + SHARP SOFT	CURSOR				
x		AUDIO MUTING	PICTURE MUTING	CURSOR				
x5		POWER*2 ON/OFF	STATUS	CURSOR				
9x			STATUS	CURSOR				
/x					RGB SIZE	INPUT		
8×		CONTRAST + HIGH			RGB SIZE RGB SHIFT			
6x		CONTRAST CONTRAST + HIGH LOW	MENU					
×		COLOR + HIGH	VIDEO			ENTER		
Ä		COLOR - LOW	INPUT A					RESET
Š			INPUT B*1					
Α×								
¥		BRITNESS + BRIGHT	POWER*2 ON					
ř		BRITNESS - DARK	POWER*2 OFF			S VIDEO		

^{*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>

x1 x2				DOT PHASE	
x3					
×4					
x5					
9x				ш.	
7x				FREEZE	
8x					
6x		<u> </u>			
×Α		V KEYSTONE		DIGITAL E	
жВ				DIGITAL ZOOM –	
xC					
Ωx					
×E					
×Ε					

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VPL-EX5U (SYY)

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