

**SONY®**

VIDEO PROJECTOR

**VPL-VW60**

PROTOCOL MANUAL

1st Edition

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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.

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

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

EVEN Parity ..... Total number of “1”s from D0 to D7 is an even number.  $\Rightarrow$  0  
..... Total number of “1”s from D0 to D7 is an odd number.  $\Rightarrow$  1

## 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 : 0xA9				
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 : 0x9A				

B0 START CORD  
Common in the all FORMAT

B6 CHECK SUM  
B1 to B5 are calculated by OR;

<Example of Calculation>

0xA9	1010	1001	0xA9	1010	1001
0xA9	1010	1001	0x9A	1001	1010
Answer	1010	1001	Answer	1011	1011
		0xA9			0xBB

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: 0x00 (Set data) GET: 0x01 (Get data)
B4	DATA	SET: Data to be set (Refer to the Appendix Table 2) GET: Unused. Set Dummy data [0x00, 0x00]
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	[0x03] Express Reply data either of ACK, or NAK
B4	DUMMY DATA	This data does not mean any senses. Dummy Data [0x00, 0x00] 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	[0x02] 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 commands 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. 30 msec.

### Note

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

## 2-8. Other

### 2-8-1. AMX Device Discovery

This model is equipped with the protocol that conforms to the Device Discovery stipulated by AMX. Contact AMX for details about the Device Discovery.

## Appendix

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	
Input	00h	01h	Video	00h		Set/Get
			S Video	01h		
			Input A	02h		
			Component	03h		
			HDMI1	04h		
			HDMI2	05h		
Picture Mode	00h	02h	Dynamic	00h		
			Standard	01h		
			Cinema	02h		
			User1	03h		
			User2	04h		
			User3	05h		
Contrast	00h	10h		00h to 64h (0 to 100)		
Brightness	00h	11h		00h to 64h (0 to 100)		
Color	00h	12h		00h to 64h (0 to 100)		
Hue	00h	13h		00h to 64h (0 to 100)		
Sharpness	00h	14h	Normal	00h to 64h (0 to 100)		
ColTemp	00h	17h	High	00h		
			Mid	01h		
			Low	02h		
			Custom1	03h		
			Custom2	04h		
			Custom3	05h		
Lamp Control	00h	1Ah	Low	00h		
			High	01h		
DDE	00h	1Bh	Off	00h		
			DDE Progressive	01h		
			DDE Film	02h		
Black Level Adj.	00h	1Ch	Off	00h		
			Low	01h		
			High	02h		
Advanced Iris	00h	1Dh	Off	00h		
			On	01h		
			Auto1	02h		
			Auto2	03h		
Real Color Processing	00h	1Eh	off	00h		
			User1	01h		
			User2	02h		
			User3	03h		

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	
Wide Mode	00h	20h	Full	00h		Set/Get
			Normal	01h		
			Wide Zoom	02h		
			Zoom	03h		
			Full1	07h		
			Full2	08h		
			Anamorphic Zoom	0bh		
Gamma Correction	00h	22h	Off	00h		
			Gamma 1	01h		
			Gamma 2	02h		
			Gamma 3	03h		
Over Scan	00h	23h	Off	00h		
			On	01h		
Screen Area	00h	24h	Full	00h		
			Through	01h		
NR	00h	25h	Off	00h		
			Low	01h		
			Middle	02h		
			High	03h		
Picture Muting	00h	30h	Off	00h		
			On	01h		
Input-A Signal Sel	00h	32h	Auto	00h		
			Computer	01h		
			Component	02h		
			Video GBR	03h		
Color Space	00h	3Bh	Normal	00h		
			Wide	01h		
USER GAIN RED	00h	50h		E2h to 1Eh (-30 to 30)		
USER GAIN GREEN	00h	51h		E2h to 1Eh (-30 to 30)		
USER GAIN BLUE	00h	52h		E2h to 1Eh (-30 to 30)		
USER BIAS RED	00h	53h		E2h to 1Eh (-30 to 30)		
USER BIAS GREEN	00h	54h		E2h to 1Eh (-30 to 30)		
USER BIAS BLUE	00h	55h		E2h to 1Eh (-30 to 30)		
Iris Sensitivity	00h	56h	Recommend	00h		
			Fast	01h		
			Slow	02h		
Iris Manual	00h	57h		00h to 64h (0 to 100)		

<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		Get only
			LAMP ERROR	01h		
			FAN ERROR	02h		
			COVER ERROR	04h		
			TEMP ERROR	08h		
			D5V ERROR	10h		
			POWER ERROR	20h		
			WARNING ERROR	40h		
			NVM Data ERROR	80h		
Status Power	01h	02h	STANBY	00h		
			START UP	01h		
			STARTUP LAMP	02h		
			POWER ON	03h		
			COOLING1	04h		
			COOLING2	05h		
			SAVING COOLING1	06h		
			SAVING COOLING2	07h		
			SAVING STABY	08h		
Lamp Timer	01h	13h	USE TIME	0000h-FFFFh *1		
Sircs (15bit category)	17h	Refer to Table4	-----	00h	00h	Set only *2
Sircs (20bit category)	19h	Refer to Table5	-----	00h	00h	

\*1 Example) In case the lamp timer indicates 1000H, return values are [03h] upper byte and [E8h] lower byte.

\*2 It is corresponded to single command only.

<Table 3>			
Item Number		Data	
Item	Data	Upper byte	Lower byte
ACK	—	00h	00h
NAK	Undefined Command	01h	01h
	Size Error		04h
	Select Error		05h
	Range Over		06h
	Not Applicable		0Ah
	Check Sum Error	F0h	10h
	Framing Error		20h
	Parity Error		30h
	Over Rub Error		40h
	Other Comm Error		50h

Waiting time for the return value is about 200 msec.

**Note**

This waiting time for the return value is subject to the conditions that communication is not bothered by any reasons.

## List of SIRCS CODE

&lt;15BIT CATEGORY&gt;

&lt;Table 4&gt;

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x								BLACK LEVEL								
1x						POWER ON/OFF *1			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	COMPONENT		POWER ON *1	POWER OFF
3x				CURSOR →	CURSOR ←	CURSOR ↑	CURSOR ↓									
4x		ADJ R	ADJ G	ADJ B				SIZE	SHIFT							
5x			W/B GAIN	W/B BIAS				INPUT SELECT			ENTER				MEMORY	S VIDEO
6x																HDMI 1
7x	HDMI 2		LENS SHIFT ↑	LENS SHIFT ↓	LENS FOCUS F	LENS FOCUS N		LENS ZOOM L	LENS ZOOM S			RESET				

\*1 Sent the command twice for [low] the standby mode.

&lt;20BIT CATEGORY&gt;

&lt;Table 5&gt;

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x									RCP	ADJUST PICTURE TOGGLE						
1x																
2x																
3x											V KEYSTONE					
4x												COLOR SPACE TOGGLE	DDE TOGGLE			
5x	PICTURE MODE DYNAMIC	PICTURE MODE STANDARD	PICTURE MODE CINEMA	PICTURE MODE USER1	PICTURE MODE USER2	PICTURE MODE USER3					PICTURE MODE TOGGLE	COLOR TEMP TOGGLE			Gamma Collection TOGGLE	IRIS MODE TOGGLE
6x	APA	DOT PHASE	LENS ZOOM	LENS SHIFT	LENS FOCUS										WIDE MODE TOGGLE	
7x									LENS CONT TOGGLE							

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