

# ***VP-11S2***

## ***RS-232C Control Specification***

**Category** : *Projector*

**Document Version** : *1.00*

**Author(s)** : *Marantz America, Inc.*

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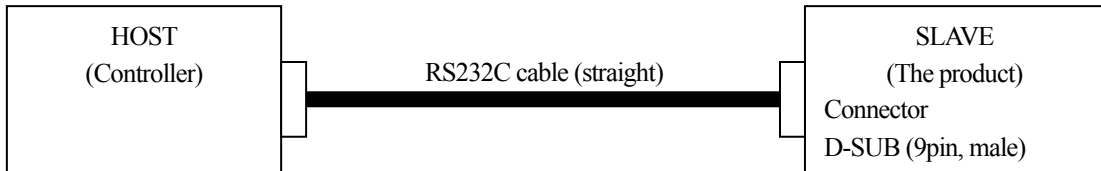
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## 1. Global Description

### 1-1. Overview

A Host controller can control or watch out the product as a Slave very easily via the communication cable.

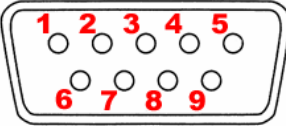
### 1-2. Block Diagram



\* The connector on the product is D-SUB 9pin male type.

\* RS232C cable has to be D-SUB 9pin female **straight type** for connecting the products.

### 1-3. Interface connection specification of the product

uP Interface	Signal name	Connection device	D-Sub Pin	Connector
-	N.C.	-	1	<The product connector> RS232C D-SUB (9pin, male) 
UART	TxD (output)	RS232C	2	
	RxD (input)	Level shift driver	3	
-	N.C.	-	4	
-	GND	GND	5	
-	N.C.	-	6	
-	N.C.	-	7	
-	N.C.	-	8	
-	N.C.	-	9	

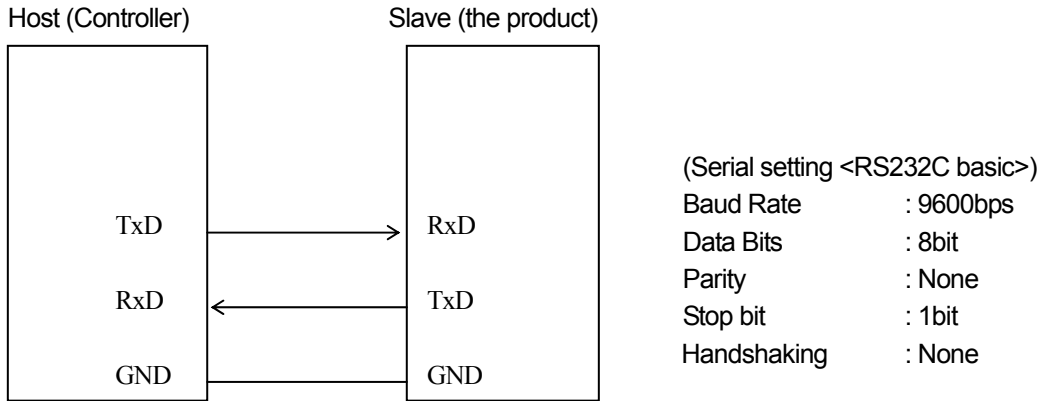
### 1-4. Assumptions and Dependencies

## 2. Detailed Description

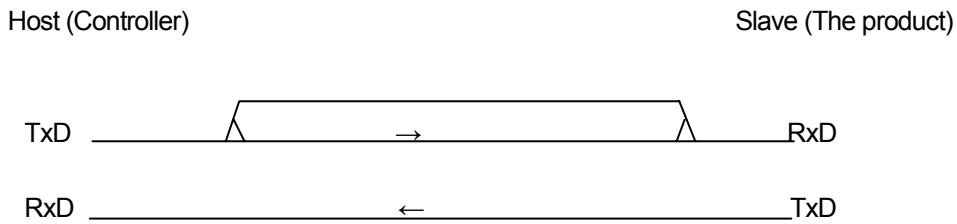
The interface specification between the product and a Host controller is described below.

### 2-1. Connection format

#### 2-1-1. Physical connection

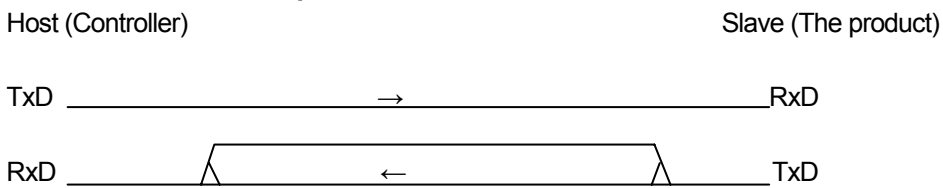


#### 2-1-1-1. Data transmission sequence from Host to Slave



1. Host starts a data transmission from TxD.
2. Host performs the data transmission of the number of required bytes, and ends a transmission.

#### 2-1-1-2. Data transmission sequence from Slave to Host



1. Slave starts a data transmission from TxD.
2. Slave performs the data transmission of the number of required bytes, and ends a transmission.

## 2-2. Transmission data format

### 2-2-1. Transmission data format from Host to Slave

There are two kinds of transmission data form from Host shown below.

#### 2-2-1-1. Form1: Command

Command is a data that requests some status change.

Start character : '@'  
 COMMAND : see "Command list"  
 End character (CR) : 0Dh

start	command	end
'@'		0Dh

#### 2-2-1-2. Form2: Status request

Status request is a data that requests a answer of some status.

Start character : '@'  
 Request status : see "Status request list"  
 Request character : '?'  
 End character (CR) : 0Dh

start	request status	end
'@'		0Dh

### 2-2-2. Transmission data format from Slave to Host

There are two kinds of transmission data form from Slave shown below.

#### 2-2-2-1. Form1: ACK/NAK

ACK is a reply data from Slave when Slave received an acceptable command data from Host.  
 (ACK is sent to Host when Slave has no related status by the Command.)

Start character : '@', ACK : 06h, End character (CR) : 0Dh

start	ACK	CR
'@'	06h	0Dh

NAK is a reply data from Slave when Slave received an incorrect Command data, Status request data or some other data from Host.

Start character : '@', NAK : 15h, End character (CR) : 0Dh

start	NAK	CR
'@'	15h	0Dh

#### 2-2-2-2. Form2: Status answer and Auto status feedback

Status answers are reply data when Slave got an acceptable Request status or Command data from Host. Auto status feedbacks are sent to Host data when a Slave's status is changed.

Start character : '@'  
 Answer character : see "Status list"  
 End character (CR) : 0Dh

start	status	end
'@'		0Dh

**2-3. The transaction sequences and the regulations**

**2-3-1. The transaction sequences**

The transactions have three kinds of sequence.

- \*A transaction is a Command from Host then Slave will be an answer by Status answer, ACK or NAK.
- \*A transaction is a Status request from Host then Slave will be an answer by Status answer or NAK.
- \*A transaction is Auto status feedback from Slave when a Slave's status changed.

**2-3-2. The transaction regulations**

The transactions have some kinds of regulation.

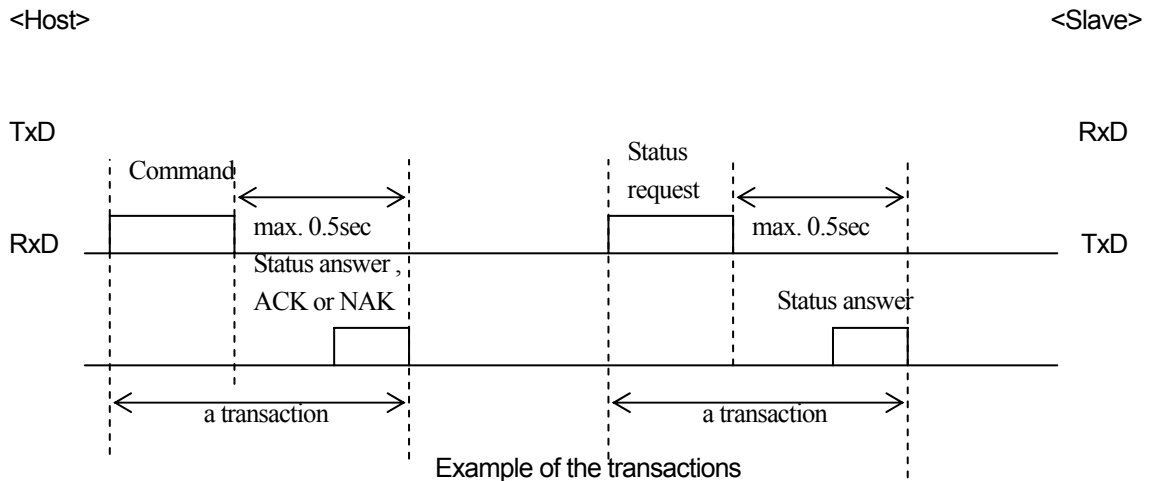
- \* An answer (ACK, NAK or Status answer) transmission by Slave has to finish within 500ms when got a Command or a Status request from Host.
- \* Host must not transmit an another Command or Status request until "it receives a answer by a previous Command or Status request" or "it passes a term of waiting time from a finishing of previous transmission of a Command or a Status request".
- \* Slave has to finish a transaction under 500ms when it sends Auto status feedback data.

**2-3-3. Specification of Auto status feedback**

There are some specific regulations about Auto status feedback.

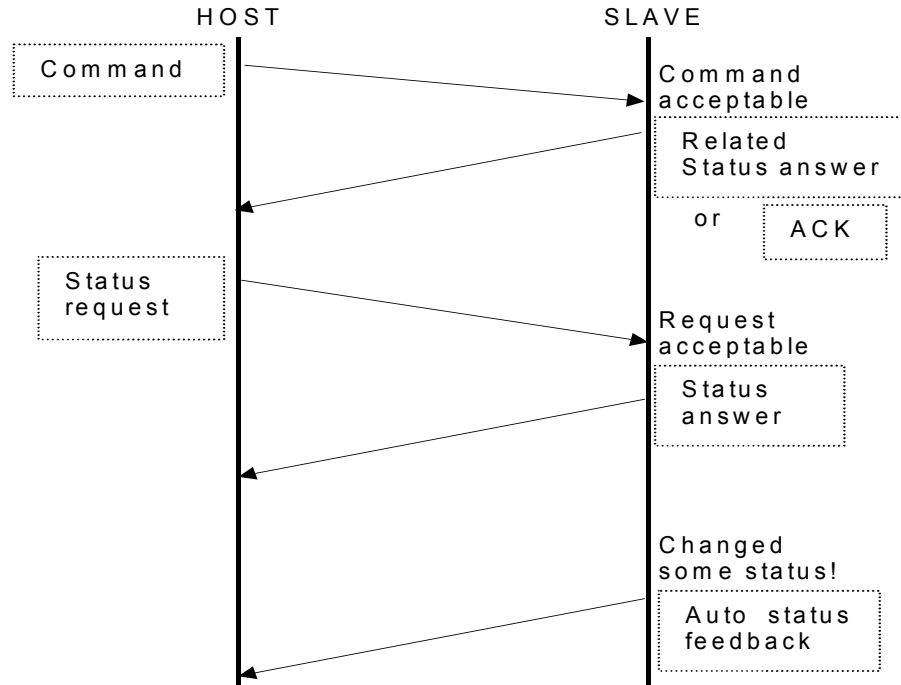
- \* Slave sends auto status feedback by itself when the status is changed.

**2-3-4. Example of the transactions**



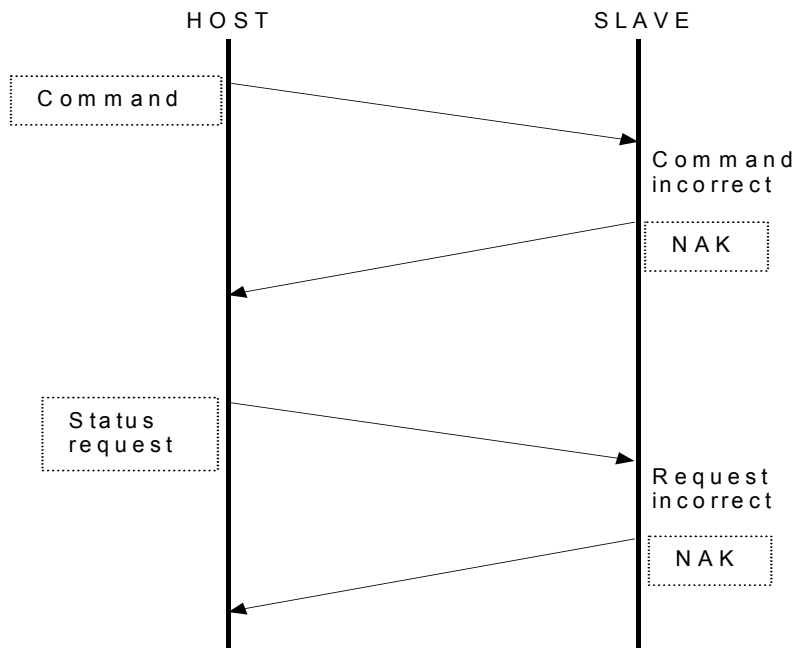
2-3-5. Examples of the handshaking flowchart

2-3-5-1. Example of successful handshaking



The product can reply ACK instead of related status, if the product can not send the related status immediatly.

2-3-5-2. Examples of handshaking error



### 3. Recommendations of Command, Status and Layer definition

- 'ACK' means that a slave has received an command. If a slave can receive a command properly, the slave sends a Host a Status data.

### 4. Definitions of Command, Status and Layer

This section describes the definition of "Command", "Status Request" and "Status" commands of this product.

#### 4-1. Normal Commands

	Function	Command	Reply from Slave
Aspect	Full	@FULL	FULL
	Normal	@NML	NML
	Zoom	@ZOOM	ZOOM
	V-Stretch	@VSTR	VSTR
	Through	@THRU	THRU
Auto Standby	Auto Standby Off	@APO0	APO0
	Auto Standby On	@APO1	APO1
Black Level	Black Level 0 IRE (Expand)	@BLVL0	BLVL0
	Black Level 7.5 IRE (Normal)	@BLVL1	BLVL1
Blanking	Blanking Off	@BLNK0	BLNK0
	Blanking 1	@BLNK1	BLNK1
	Blanking 2	@BLNK2	BLNK2
	Blanking 3	@BLNK3	BLNK3
Cinema	Cinema Off	@CINEMA0	CINEMA0
	Cinema Auto	@CINEMA1	CINEMA1
Color Lock	Lock Red	@LOCKR	LOCKR
	Lock Green	@LOCKG	LOCKG
	Lock Blue	@LOCKB	LOCKB
	Lock Cancel	@LOCKC	LOCKC
Color Wheel Speed	x4 Speed	@CWX4	CWX4
	X5 Speed	@CWX5	CWX5
	X6 Speed	@CWX6	CWX6
Cursor	Up	@UP	UP
	Down	@DOWN	DOWN
	Right	@RIGHT	RIGHT
	Left	@LEFT	LEFT
	Enter	@ENTER	ENTER
Focus Pattern	Pattern Off	@PAT0	PAT0
	Pattern On	@PAT1	PAT1
Information	Information Off	@INFO0	INFO0
	Information On	@INFO1	INFO1
Input Select	Component 1	@CMP1	CMP1
	Component 2	@CMP2	CMP2
	S-Video	@SVD	SVD
	Video	@VDO	VDO
	RGB	@RGB	RGB
	HDMI 1	@HDMI1	HDMI1
	HDMI 2	@HDMI2	HDMI2



	Function	Command	Reply from Slave
Installation	Installation Front	@FFLOR	FFLOR
	Installation Rear	@RFLOR	RFLOR
	Installation Front Ceiling	@FCEIL	FCEIL
	Installation Rear Ceiling	@RCEIL	RCEIL
Iris	Iris 1	@IRIS1	IRIS1
	Iris 2	@IRIS2	IRIS2
	Iris 3	@IRIS3	IRIS3
Keystone	Keystone V +	@KEYV+	KEYV+
	Keystone V -	@KEYV-	KEYV-
	Keystone V Set	@KEYV<p1>	KEYV+hex, KEYV-hex
Lamp Mode	Lamp Mode High (Normal)	@LMODEH	LMODEH
	Lamp Mode Low (Economy)	@LMODEL	LMODEL
Menu	Menu Off	@MENU0	MENU0
	Menu On	@MENU1	MENU1
Picture Mode	Theater Default	@THED	THED
	Theater 1	@THE1	THE1
	Theater 2	@THE2	THE2
	Theater 3	@THE3	THE3
	Standard Default	@STDD	STDD
	Standard 1	@STD1	STD1
	Standard 2	@STD2	STD2
	Standard 3	@STD3	STD3
	Dynamic Default	@DYND	DYND
	Dynamic 1	@DYN1	DYN1
	Dynamic 2	@DYN2	DYN2
	Dynamic 3	@DYN3	DYN3
	User 1	@USR1	USR1
	User 2	@USR2	USR2
	User 3	@USR3	USR3
	User 4	@USR4	USR4
	User 5	@USR5	USR5
	User 6	@USR6	USR6
	User 7	@USR7	USR7
	User 8	@USR8	USR8
User 9	@USR9	USR9	
Power	Power Off (Standby)	@PWR0	PWR0
	Power On	@PWR1	PWR1
RGB Sync.	RGB Sync. 1	@RGSB1	RGSB1
	RGB Sync. 2	@RGSB2	RGSB2
	RGB Sync. 3	@RGSB3	RGSB3
	RGB Sync. Auto	@RGSBA	RGSBA
V-Mute	V-Mute Off	@MUT0	MUT0
	V-Mute On	@MUT1	MUT1

## 4-2. Status Request and Status (answer and feedback) Commands

Request Status	Request Command	Answer	Answer Command
Aspect	ASP?	Full	@FULL
		Normal	@NML
		Zoom	@ZOOM
		V-Stretch	@VSTR
		Through	@THRU
Auto Standby	APO?	Off	@APO0
		On	@APO1
Black Level	BLVL?	0IRE or EXPAND	@BLVL0
		7.5IRE or NORMAL	@BLVL1
Blanking Mode	BLNK?	Off	@BLNK0
		Memory 1	@BLNK1
		Memory 2	@BLNK2
		Memory 3	@BLNK3
Cinema	CINEMA?	Auto	@CINEMA1
		Off	@CINEMA0
Color Wheel Speed	CWX?	x4 Speed	@CWX4
		x5 Speed	@CWX5
		x6 Speed	@CWX6
Focus Pattern	PAT?	Off	@PAT0
		On	@PAT1
Information	INFO?	Off	@INFO0
		On	@INFO1
Input Select	SRC?	Component-1	@CMP1
		Component-2	@CMP2
		S-Video	@SVD
		Video (Composite)	@VDO
		RGB	@RGB
		HDMI-1	@HDMI1
		HDMI-2	@HDMI2
Installation Mode	INST?	Front-Table Top	@FFLOR
		Rear-Table Top	@RFLOR
		Front-Ceiling	@FCEIL
		Rear-Ceiling	@RCEIL
Iris	IRIS?	Iris 1	@IRIS1
		Iris 2	@IRIS2
		Iris 3	@IRIS3
Keystone	KEYV?	Value	@KEYV/###(±DEC)
Lamp Mode	LMODE?	High	@LMODEH
		Low	@LMODEL
Menu	MENU?	Off	@MENU0
		On	@MENU1
Power	PWR?	Off	@PWR0
		On	@PWR1
Projector Status	POW?	Standby	@STBY
		Starting Up	@WAIT
		Lamp On	@PWON
		Cooling	@COOL
		Error	@ERROR

Request Status	Request Command	Answer	Answer Command
Projector Status	POW?	Standby	@STBY
		Starting Up	@WAIT
		Lamp On	@PWON
		Cooling	@COOL
		Error	@ERROR
Picture Mode	MEM?	Theater Default	@THED
		Teater 1	@THE1
		Teater 2	@THE2
		Theater 3	@THE3
		Standard Default	@STDD
		Standard 1	@STD1
		Standard 2	@STD2
		Standard 3	@STD3
		Dynamic Default	@DYND
		Dynamic 1	@DYN1
		Dynamic 2	@DYN2
		Dynamic 3	@DYN3
		User 1	@USR1
		User 2	@USR2
		User 3	@USR3
		User 4	@USR4
		User 5	@USR5
		User 6	@USR6
		User 7	@USR7
		User 8	@USR8
User 9	@USR9		
RGB Sync.	RGSB?	Memory1	@RGSB1
		Memory2	@RGSB2
		Memory3	@RGSB3
		Auto	@RGSBA
V-Mute	MUT?	Off	@MUT0
		On	@MUT1
All Status	STAT?	All Status Requests except marked *	
Lamp life*	LAMPLIFE?	Hour	@LAMPLIFE/##### (#:Hex)
Total Time*	TIME?	Hour	@TIME/##### (#:Hex)
Error Mode*	ERR?	No Error	@None
		Lamp Door Open	@DoorOpen
		Lamp On	@Lamp On
		Lamp Life Over	@Lamp Life Over
		Lamp Temperature	@Lamp Temperature
		Power Supply Temp.	@Power Unit Temperature
		Fan Lock	@FAN Lock
		FPGA Configuration	@FPGA Config
		Main $\mu$ -com Communication	@Main $\mu$ -com Communication
Command List*	?		

## 5. Revision history

Rev.	Date	Owner	Change description
1.00	10/12/07	Marantz America, Inc.	Issued Revision1.0