

PC Control Specification for VP-12S1

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1. PC Control

Interface

- * RS-232C(Straight Cable)
- * Baud rate: 9600 bps
- * Data length: 8 bits
- * Parity: None
- * Stop bit:..... 1 bit
- * Flow Control: RTS/CTS
- * Communication procedure: Full duplex

2. PC Control Command Reference

2.1. Command Communications Sequence

Projector returns ACK, NAK, or Status after reception of Command within 1 second.

An ASCII code is used for data. It is discriminated whether transmitting character sequences are a capital letter and a small letter.

Although there is no distinction of a capital letter small letter, let a capital letter be a standard.

Command transmission and Status reply add Start Character and End Character as follows.

Start Character	:	'@'	
End Character	:	0x0D	
Command Sample	:	"@PWR?", 0x0D	(Request Power Status)
Feedback Sample	:	"@PWR1", 0x0D, 0x0A	(Power Status = On)

ACK and NAK use the following control code.

ACK(Reception success)	:	0x06, 0x0D, 0x0A
NAK(Reception failure)	:	0x15, 0x0D, 0x0A

A reception side cancels data before '@'. When 0x0D comes, with '@' not coming, NAK (reception failure) is returned.

That which made Hex the ASCII code is used for transmission and reception of digital data.

Between a command and a numerical value, '/' is inserted as a delimiter.

For Example: When 26(decimal) of the number is expressed

'1', 'A' → 0x31, 0x41

2.2. Normal Command

It is Command which demands processing.

In data other than an appointed command, or the state where '@' does not come, when 0x0D comes, it becomes reception failure, and NAK is returned.

Commands, such as Power On Command at the time of notes Standby (Fan operation), return only ACK, when processing is not carried out.

For example: When Power On is sent to Projector.

Command transmission from PC.

"@PWR", 0x0D

After Command processing end and from a projector to a reply

0x06, 0x0D, 0x0A (ACK reception success)

or 0x15, 0x0D, 0x0A (NAK reception failure)

2.3. Request Status Command

It is Command which demands Status.

Projector returns Status or NAK.

In data other than an appointed command, or the state where '@' does not come, when 0x0D comes, it becomes reception failure, and NAK is returned.

For Example: When Power Status is requested to Projector.

Command transmission from PC.

"@PWR?", 0x0D

After Command processing end and from a projector to a reply

"@PWR1", 0x0D, 0x0A (Power On)

or "@PWR0", 0x0D, 0x0A (Standby)

or 0x15, 0x0D, 0x0A (NAK reception failure)

2.4. Normal Command List

Command	Character	Example	
Power	Power On	PWR1	"@PWR1", 0x0D
	Standby	PWR0	"@PWR0", 0x0D
Source	Component	CMP	"@CMP", 0x0D
	S-Video	SVD	"@SVD", 0x0D
	Video	VDO	"@VDO", 0x0D
	RGB	RGB	"@RGB", 0x0D
	Aux.	AUX	"@AUX", 0x0D
Memory	Theater1	THE1	"@THE1", 0x0D
	Theater2	THE2	"@THE2", 0x0D
	Theater3	THE3	"@THE3", 0x0D
	Theater Default	THED	"@THED", 0x0D
	Standard 1	STD1	"@STD1", 0x0D
	Standard 2	STD2	"@STD2", 0x0D
	Standard 3	STD3	"@STD3", 0x0D
	Standard Default	STDD	"@STDD", 0x0D
	Dynamic 1	DYN1	"@DYN1", 0x0D
	Dynamic 2	DYN2	"@DYN2", 0x0D
	Dynamic 3	DYN3	"@DYN3", 0x0D
	Dynamic Default	DYND	"@DYND", 0x0D
Aspect	Normal	NML	"@NML", 0x0D
	Through	THRH	"@THRH", 0x0D
	Full	FULL	"@FULL", 0x0D
	Zoom	ZOOM	"@ZOOM", 0x0D
V-Mute	V-Mute On	MUT1	"@MUT1", 0x0D
	V-Mute Off	MUT0	"@MUT0", 0x0D
Keystone V	Keystone V+	KEYV+	"@KEYV+", 0x0D
	Keystone V-	KEYV-	"@KEYV-", 0x0D
	Keystone V ##	KEYV/##	"@KEYV/0F", 0x0D
Keystone H	Keystone H+	KEYH+	"@KEYH+", 0x0D
	Keystone H-	KEYH-	"@KEYH-", 0x0D
	Keystone H ##	KEYH/##	"@KEYH/0F", 0x0D
Focus	Focus On	FOC1	"@FOC1", 0x0D
	Focus Off	FOC0	"@FOC0", 0x0D
Black Setup	Black Setup 0IRE	BSET0	"@BSET0", 0x0D
	Black Setup 7.5IRE	BSET7	"@BSET7", 0x0D
Lamp Mode	Lamp Mode High	LMODEH	"@LMODEH", 0x0D
	Lamp Mode Low	LMODEL	"@LMODEL", 0x0D

Adjustment range

Command	Minimum	Center	Maximum
Keystone V	-1E (-30)	0 (0)	+1E (+30)
Keystone H	-14 (-20)	0 (0)	+14 (+20)

2.5. Request Status Command List

Request Status	Request Command	Answer Example			
Power	"@PWR?", 0x0D	On	"@PWR1", 0x0D, 0x0A		
		Standby	"@PWR0", 0x0D, 0x0A		
Source	"@SRC?", 0x0D	Component	"@CMP", 0x0D, 0x0A		
		S-Video	"@SVD", 0x0D, 0x0A		
		Video	"@VDO", 0x0D, 0x0A		
		RGB	"@RGB", 0x0D, 0x0A		
		AUX.	"@AUX", 0x0D, 0x0A		
Memory	"@MEM?", 0x0D	Theater1	"@THE1", 0x0D, 0x0A		
		Theater2	"@THE2", 0x0D, 0x0A		
		Theater3	"@THE3", 0x0D, 0x0A		
		Theater Default	"@THED", 0x0D, 0x0A		
		Standard 1	"@STD1", 0x0D, 0x0A		
		Standard 2	"@STD2", 0x0D, 0x0A		
		Standard 3	"@STD3", 0x0D, 0x0A		
		Standard Default	"@STDD", 0x0D, 0x0A		
		Dynamic 1	"@DYN1", 0x0D, 0x0A		
		Dynamic 2	"@DYN2", 0x0D, 0x0A		
		Dynamic 3	"@DYN3", 0x0D, 0x0A		
		Dynamic Default	"@DYND", 0x0D, 0x0A		
		Aspect	"@ASP?", 0x0D	Normal	"@NML", 0x0D, 0x0A
				Through	"@THRH", 0x0D, 0x0A
Full	"@FULL", 0x0D, 0x0A				
Zoom	"@ZOOM", 0x0D, 0x0A				
V-Mute	"@MUT?", 0x0D	On	"@MUT1", 0x0D, 0x0A		
		Off	"@MUT0", 0x0D, 0x0A		
Keystone V	"@KEYV?", 0x0D	12	"@KEYV/+0C", 0x0D, 0x0A		
Keystone H	"@KEYH?", 0x0D	20	"@KEYH/+14", 0x0D, 0x0A		
Focus	"@FOC?", 0x0D	On	"@FOC1", 0x0D, 0x0A		
		Off	"@FOC0", 0x0D, 0x0A		
Black Setup	"@BSET?", 0x0D	0IRE	"@BSET0", 0x0D, 0x0A		
		7.5IRE	"@BSET7", 0x0D, 0x0A		
Lamp Mode	"@LMODE?", 0x0D	HIGH	"@LMODEH", 0x0D, 0x0A		
		LOW	"@LMODEL", 0x0D, 0x0A		
Error Status* ¹	"@ERR?", 0x0D	No Error	"Error : None", 0x0D, 0x0A		
		Lamp Door Open	"Error : Door Open", 0x0D, 0x0A		
Version* ²	"@VER?", 0x0D	Version 01.00	"0100", 0x0D, 0x0A		
Instruction	"@?", 0x0D	Display Command			

*¹ The contents of Error are indicated separately.

*² Version number shows Version of a RC-232C Command group.

2.6. Special Command List

Request Status	Request Command	Example	
Gamma Set	Gamma Set at Standard	GSSTD/##	"@GSSTD/04", 0x0D
	Gamma Set at Dynamic	GSDYN/##	"@GSDYN/05", 0x0D
	Gamma Set at Theater	GSTHE/##	"@GSTHE/06", 0x0D
Color Temp Adjust Value Set* ¹	C Temp. Red at Low* ²	CTAL/R/###	"@CTAL/R/012", 0x0D
	C Temp. Green at Low	CTAL/G/###	"@CTAL/G/345", 0x0D
	C Temp. Blue at Low	CTAL/B/###	"@CTAL/B/678", 0x0D
	C Temp. Red at Mid.* ²	CTAL/R/###	"@CTAM/R/9AB", 0x0D
	C Temp. Green at Mid.	CTAM/G/###	"@CTAM/G/CDE", 0x0D
	C Temp. Blue at Mid.	CTAM/B/###	"@CTAM/B/F01", 0x0D
	C Temp. Red at High* ²	CTAL/R/###	"@CTAH/R/234", 0x0D
	C Temp. Green at High	CTAH/G/###	"@CTAH/G/567", 0x0D
	C Temp. Blue at High	CTAH/B/###	"@CTAH/B/89A", 0x0D
Color Temp Value Get	C Temp at Low	CTAL?	"@CTAL?"
	C Temp at Mid.	CTAM?	"@CTAM?"
	C Temp at High	CTAH?	"@CTAH?"
	Answer	R = 10, G = 11, B = 20	"R=0x000A/G=0x000B/B=0x0014", 0x0D, 0x0A
Color Temp Mode Set	C Temp Low	CTL	"@CTL", 0x0D, 0x0A
	C Temp Mid.	CTM	"@CTM", 0x0D, 0x0A
	C Temp High	CTH	"@CTH", 0x0D, 0x0A

*¹ It becomes effective, after Setting Color Temp Mode

*² Usually, it is not used.

Status	Request Sample		Answer Sample	
Bin Voltage	Voltage B	"@BINVOL/1"	ACK	0x06,0x0D,0x0a
	Voltage C	"@BINVOL/2"	ACK	0x06,0x0D,0x0a
	Voltage D	"@BINVOL/3"	ACK	0x06,0x0D,0x0a
	Voltage E	"@BINVOL/4"	ACK	0x06,0x0D,0x0a
	Voltage?	"@BINVOL?"	Voltage B	"@BINVOL/1"
Color Wheel Adjust	Index Delay 3	"@CWA/DELAY/3"	ACK	0x06,0x0D,0x0a
	Index Delay?	"@CWA/DELAY?"	Index Delay 5	"@CWA/DELAY/0005"

Adjustment range

Command	Minimum	Center	Maximum
Color Temp Adjust Set	0 (0)	-	FFF(+3.99902)
Color Wheel Adjust	0 (0)	-	2CF(719)

Request Status	Request Command	Answer Sample	
Read Sync	"@SYNC?", 0x0D	V=60 [Hz],H=525 [Lines],C=550 [Lines]	
		"V=6400/H=020D/C=0226", 0x0D, 0x0A	
Read Build Num.	"@BUILD?", 0x0D	Build 0025	"0025", 0x0D, 0x0A
Read Boot Program Version	"@BOTVER?", 0x0D	Boot Ver. 00.10	"0010", 0x0D, 0x0A
Read Firmware Program Version	"@FRMVER?", 0x0D	Firmware Ver. 00.10	"0010", 0x0D, 0x0A
Read Order	"@ORDER?", 0x0D	413V	"@413V", 0x0D, 0x0A
Instruction for Engineer	"@???"	Display Command for Engineer	

The meaning of the parameter in Gamma Set command is described below.

Parameter	Description
00	Select a Gamma Table 1 defined by Texas Instruments in HDFP
01	Select a Gamma Table 2 defined by Texas Instruments in HDFP
02	Select a Gamma Table 3 defined by Texas Instruments in HDFP
03	Reserved
04	Select a Gamma Table 1 defined by Texas Instruments in HDFP u-com
05	Select a Gamma Table 2 defined by Texas Instruments in HDFP u-com
06	Select a Gamma Table 3 defined by Texas Instruments in HDFP u-com
07	Select a Gamma Table 4 defined by Texas Instruments in HDFP u-com
08	Select a Gamma Table 5 defined by Texas Instruments in HDFP u-com
09	Select a Gamma Table 6 defined by Texas Instruments in HDFP u-com
0A	Select a Gamma Table 7 defined by Texas Instruments in HDFP u-com
0B	Select a Gamma Table 8 defined by Texas Instruments in HDFP u-com
0C	Select a Gamma Table 9 defined by Texas Instruments in HDFP u-com
0D	Select a Gamma Table 1 defined by User(MJI) in EEPROM
0E	Select a Gamma Table 2 defined by User(MJI) in EEPROM
0F	Select a Gamma Table 3 defined by User(MJI) in EEPROM

It is asked for frequency by the following formulas from the return value of V Sync. In addition, since return value is Hex, be careful.

$$\frac{1}{\text{return value} \times \frac{8}{12.288 \times 10^6}} = \text{frequency [Hz]}$$

Build Number expresses the thing of a sub microcomputer.

Boot Program Version number the thing of a sub microcomputer.

Firmware Program Version number the thing of a sub microcomputer.

I²C Direct Write Command

"@IICW/##/##/##"

For Example: When 0xDF value is written in Device Address = 0x88 and Sub Address = 0x02

"@IICW/88/02/DF"

For Example: When 0x12 is written in Device Address = 0x46 and Sub-Address="specification-less"

"@IICW/46/--/12"

• I²C Direct Read Command

"@IICR/##/##"

For Example: When read-out is performed from Device Address = 0x89 and Sub Address = 0x01. The read value presupposes that it was 0xAA.

"@IICR/89/01"

"AA"

// It is the character sequence returned from Sub u-com.

For Example: When read-out is performed from Device Address = 0x47 and Sub-Address = "specification-less". The read value presupposes that it was 0x23.

"@IICR/47/--"

"23"

// It is the character sequence returned from Sub u-com.

• User Gamma Table rewriting command

It is the command which rewrites User Gamma Table which has three for R, G, and every B. Commands are as follows.

- "@UG/1/R" The command which rewrites R Table of User Gamma Table 1
- "@UG/1/G" The command which rewrites G Table of User Gamma Table 1
- "@UG/1/B" The command which rewrites B Table of User Gamma Table 1
- "@UG/2/R" The command which rewrites R Table of User Gamma Table 2
- "@UG/2/G" The command which rewrites G Table of User Gamma Table 2
- "@UG/2/B" The command which rewrites B Table of User Gamma Table 2
- "@UG/3/R" The command which rewrites R Table of User Gamma Table 3
- "@UG/3/G" The command which rewrites G Table of User Gamma Table 3
- "@UG/3/B" The command which rewrites B Table of User Gamma Table 3

Command forms are as follows. CR is "0x0d, 0x0A".

- "@UG/1/R" CR // R Table rewriting of User Gamma Table1 is specified.
- "0123" CR // ASCII (Hex) character describes Gamma value.
- "4567" CR // If it is 0x4567, it will be described as "4567."
- "89AB" CR // 512 value per command is transmitted.
- "CDEF" CR // Check every one thing which Com Device completed transmission at the time of transmission of gamma value.

- "0123" CR
- "Complete" CR // This character sequence is transmitted from VP12.

It is the command that reads User Gamma.

Commands are as follows

- "@UG?/1/R" The command which read R Table of User Gamma Table 1

Command forms are as follows

- "@UG/1/R" CR // R Table reading of User Gamma Table1 is specified.
- "0123" CR // The following is received from VP12
- "4567" CR // ASCII (Hex) character describes Gamma value.
- "89AB" CR // If it is 0x4567, it will be described as "4567."
- "0123" CR // 512 value per command is received.

- "0123" CR // The 512th word.