LC-X6 / LC-SX6

BASIC SERIAL COMMAND

FUNCTIONAL SPECIFICATIONS

Records of Modification

Rev.	Date	Page	Content
	2004.11.8		New released

- CONTENTS -

1 Overview

1.1 This specification defines projector control commands for LC-X6 / LC-SX6.

1.2 The projector control commands are used to control a projector through RS-232C from a computer.

1.3 When using commands with address, see [8. Command with Address Specification].

2 Serial Interface Specification

2.1 Transfer Specification

Items	Specification
Synchronous system	Asynchronous
Transmission Speed	9600 / 19200
Data Length	8 bit
Parity	N/A
Stop Bit	1
Flow Control	N/A

1) Transmission speed: initial setting value is 19200.

2) Transmission speed can be changed in "SPECIAL" – "RS-232C" in the menu.

2.2 Connection

Dedicated serial cable that comes with the projector must be used for a connection to a computer and a projector.

PC
COM 1

Projector
Serial Port IN

CD	1			1	N.C.
RXD	2			2	RXD
TXD	3			3	TXD
DTR	4			4	N.C.
SG	5			5	SG
DSR	6			6	N.C.
RTS	7			7	RTS
CTS	8			8	CTS
RING	9			9	N.C.

(D-Sub 9Pin)   (D-Sub 9Pin)

Connect COM port of a computer to SERIAL PORT IN of a projector.

COM Port (COM1 or COM2) of a computer is specified by control software of a computer.

3   Notes for Communication

3.1   The projector command is defined as one command/one line that starts with "C" and ends with carriage return (0x0D).

3.2   When the projector receives carriage return, it starts decoding.

3.3   There are two types of commands: Functional Execution Commands and Status Read Commands.

    Example of Functional Execution Command: "C05" [CR]

    Example of Status Read Command: "CR0" [CR]

3.4   It clears the information of buffer as below.

    3.4.1   When the projector receives LF (0x0A) or EOF (0x1A).

    3.4.2   When it takes more than one second to receive one command.

    (Until the projector returns carriage return since it has received the first data.)

3.5   When control command pipelining, wait the interval of time after the response as below.

    3.5.1   [VOLUME +/-] [ZOOM UP/DOWN] [FOCUS UP/DOWN] [LENS SHIFT UP/ DOWN/ LEFT/ RIGHT] Commands   ⟶   100ms

    3.5.2   Other Commands   ⟶   500ms

3.6   When Status Read command pipelining, wait at least 500ms after the response.

3.7   Do not issue any command before receiving the response except there is no response for 5 seconds.

3.8   It takes about 7 seconds for the internal initialization after plugging in AC. During this time, it cannot process commands. Do not issue any command.

3.9   For 7 seconds after Power ON from Standby, the projector receives a command and returns the response but does not execute it because of the internal initialization or Lamp processing. However, Status Read Commands are carried out after 500 ms when receiving the response to Power ON command.

3.10   About Count Down and the performance after Cooling Down:
When receiving a command during Count Down after Power ON or Cooling Down after Power OFF, the projector returns the response but does not carry it out. However, Status Read Commands are carried out.

3.11   The performance for switching Input:
It takes 5 seconds to switch Input after receiving the command. When receiving the command during this time, it is not executed. However, Status Read Commands are carried out after 500ms since it receives the response to switching Input command.

3.12   The number of character of response to Status Read Commands depends on commands. Please see [7. Status Read Commands].

3.13   Characters for commands must be Capital (A - Z).

4. **Functional Execution Command Table**

Command	Item	Command	Item
C00	POWER ON	C3F	ENTER
C01	POWER OFF (Quick Power Off)	C43	FREEZE ON
C03	INPUT 5	C44	FREEZE OFF
C05	INPUT 1	C46	ZOOM -
C06	INPUT 2	C47	ZOOM +
C07	INPUT 3	C4A	FOCUS -
C08	INPUT 4	C4B	FOCUS +
C09	VOLUME +	C5D	LENS SHIFT UP
C0A	VOLUME -	C5E	LENS SHIFT DOWN
C0B	SOUND MUTE ON	C5F	LENS SHIFT LEFT
C0C	SOUND MUTE OFF	C60	LENS SHIFT RIGHT
C0D	SHUTTER ON	C70	FULL LAMP MODE (2 Lamp)
C0E	SHUTTER OFF	C71	HALF LAMP MODE (1Lamp:1)
C0F	SCREEN NORMAL SIZE	C72	HALF LAMP MODE (1 Lamp:2)
C10	SCREEN FULL SIZE	C89	AUTO PC ADJ.
C1C	MENU ON	*C8A	PRESENTATION TIMER
C1D	MENU OFF	*C8E	KEYSTONE ↑
C1E	DISPLAY CLEAR	*C8F	KEYSTONE ↓
C27	IMAGE（Toggle）	**C90	KEYSTONE →
*C30	D.ZOOM +	**C91	KEYSTONE ←
*C31	D.ZOOM -		
C3A	POINTER RIGHT		
C3B	POINTER LEFT		
C3C	POINITER UP		
C3D	POINITER DOWN		

* & ** = Not compatible with Option Control No.5 (Available for Option Control No.06).

** = Not available for LC-SX6 (SXGA+ model) because horizontal keystone function is not installed.

5. **Status Read Command Table**

Command	Item	Memo
CR0	Status Read	
CR1	Input Mode Read	
CR3	Lamp Time Read	
CR4	Setting Read	
CR6	Temp Read	
CR7	Lamp Mode Read	
CR9	PC Type Read	
CRA	Status 2 Read	

6.   Functional Execution Command

6.1   Format

6.1.1   PC issues a command in format as below.

"C" COMMAND **[CR]**

Command: two characters (See Basic Functional Execution Command Table)

6.1.2   A projector changes received data to decode and returns a result after being ready to receive next command.

[ACK] [CR]: (0x06, 0x0D) When received Functional Execution Commands.

**"?" [CR]:** When the received data cannot be decoded.

6.2   Command Pipelining

When some functions need the command pipelining, the performance is the same as that of the remote control.

1)   System: issue any command every 100 ms

2)   When receiving the appropriate command, the function is executed for 120 ms from the moment.

3)   When receiving the same command continuously within 120 ms, the function is executed for another 120 ms from the moment.

4)   When there is no incoming command after 120 ms, the execution of pipelining is stopped.

5)   When the projector receives other incoming commands within 120ms, the execution of pipelining is stopped.

6.3   Transfer Example

Select Input 3 for the projector with Basic Command.

Command

PC → Projector	"C"	"0"	"7"	CR

Projector → PC | ACK | CR |

Processing
(a few ms ~ 1s)
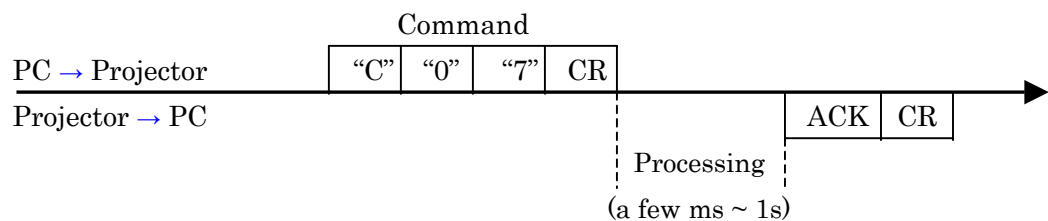
6.4   Operation Requirements

When the projector's status in this below, Functional Execution Commands are limited.

(Status Read Commands are available in this status.)

Projector Status	Available Functional Execution Commands
Standby Mode	C00: POWER ON
Processing Countdown	C00: POWER ON (Countdown is terminated)
Processing Cooling Down	NONE
Cooling Down due to Abnormal Temperature	NONE
Abnormal Temperature Status	NONE
Switching Mode	NONE
Processing Power Save / Cooling Down	NONE

Processing Cooling Down due to Power management	NONE
Power Save Status	C00: POWER ON C01: POWER OFF

Note) When the status is above, even if the projector receives other commands, it returns **[ACK] [CR].**

6.5   POWER ON Command

COMMAND	"C00" [CR]
Detail	Power ON When already Power is ON, no need to do. When sending this command during processing Countdown, Countdown is terminated. Note) The response of acceptance does not always mean that the status has already moved to Power ON. Ex: When the temperature approaches abnormal status after returning the response [ACK] [CR] to the command "C00". Therefore, it needs to get the projector status with Status Read command.
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.6   POWER OFF Command (QUICK POWER OFF)

COMMAND	"C01" [CR]
Detail	Power OFF (Standby) When Power is OFF with ON-OFF button of the projector and remote control, "Power OFF" is displayed. However, as soon as this command is sent, Quick Power OFF is executed.
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.7   INPUT 1 Command

COMMAND	"C05" [CR]
Detail	Select Input 1.
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.8   INPUT 2 Command

COMMAND	"C06" [CR]
Detail	Select Input 2
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.9   INPUT 3 Command

COMMAND	"C07" [CR]
Detail	Select Input 3
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.10 INPUT 4 Command

COMMAND	"C08" [CR]	
Detail	Select Input 4	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.11 INPUT 5 Command

COMMAND	"C03" [CR]	
Detail	Select Input 5 Note) When there is no card inserted to Slot 5, it is not executed.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.12 VOLUME + Command

COMMAND	"C09" [CR]	
Detail	Volume Up	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.13 VOLUME - Command

COMMAND	"C0A" [CR]	
Detail	Volume Down	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.14 SOUND MUTE ON Command

COMMAND	"C0B" [CR]	
Detail	Sound Mute ON The same operation as "MUTE" button of the remote control for Mute ON, but it does not work for Mute OFF.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.15 SOUND MUTE OFF Command

COMMAND	"C0C" [CR]	
Detail	Sound Mute OFF The same operation as "MUTE" button of the remote control for Mute OFF, but it does not work for Mute ON.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.16 SHUTTER ON Command

COMMAND	"C0D" [CR]
Detail	Black out an image by releasing the Shutter The same operation as "Shutter" button of the projector and remote control for Shutter ON, but it does not work for Shutter OFF.
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.17 SHUTTER OFF Command

COMMAND	"C0E" [CR]
Detail	Restore an image by opening the Shutter The same operation as "Shutter" button of the projector and remote control for Shutter OFF, but it does not work for Shutter ON.
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.18 SCREEN NORMAL SIZE Command

COMMAND	"C0F" [CR]
Detail	Set screen size to Normal
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.19 SCREEN FULL SIZE Command

COMMAND	"C10" [CR]
Detail	Set screen size to Full screen
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.20 MENU ON Command

COMMAND	"C1C" [CR]
Detail	Display Menu of On Screen Display
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.21 MENU OFF Command

COMMAND	"C1D" [CR]
Detail	Clear Menu of On Screen Display
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.22   DISPLAY CLEAR Command

COMMAND	"C1E" [CR]	
Detail	Clear the On Screen Display Clear all On Screen Display unconditionally.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.23   IMAGE Command

COMMAND	"C27" [CR]	
Detail	Switch Image Setting	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?"[CR]

6.24   D.ZOOM + Command

COMMAND	"C30" [CR]	
Detail	Enter Digital Zoom Mode and expand image size	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.25   D.ZOOM – Command

COMMAND	"C31" [CR]	
Detail	Enter Digital Zoom Mode and compress image size	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.26   POINTER RIGHT Command

COMMAND	"C3A" [CR]	
Detail	Move Pointer of On-Screen Display Menu to the right This command performs the same operation as tapping the right side of control pad on the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.27   POINTER LEFT Command

COMMAND	"C3B" [CR]	
Detail	Move Pointer of On Screen Display Menu to the left The same operation as tapping the left side of the control pads on the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.28 POINTER UP Command

COMMAND	"C3C" [CR]	
Detail	Move Up Pointer of On Screen Display Menu The same operation as tapping the upper side of the control pads on the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.29 POINTER DOWN Command

COMMAND	"C3D" [CR]	
Detail	Move Down Pointer of On Screen Display Menu The same operation as tapping the downside of the control pads on the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.30 ENTER Command

COMMAND	"C3F" [CR]	
Detail	The same operation as "SELECT" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.31 FREEZE ON Command

COMMAND	"C43" [CR]	
Detail	Freeze picture on-screen The same operation as "FREEZE" button of the remote control for Freeze ON, but it does not work for Freeze OFF.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.32 FREEZE OFF Command

COMMAND	"C44" [CR]	
Detail	Cancel Freeze function The same operation as "FREEZE" button of the remote control for Freeze Off, but it does not work for Freeze ON.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.33 ZOOM + Command

COMMAND	"C47" [CR]	
Detail	Make screen image larger The same operation as "ZOOM $\triangle$" button of the remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.34 ZOOM – COMMAND

COMMAND	"C46" [CR]	
Detail	Make screen image smaller The same operation as "ZOOM ▽" button of the remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.35 FOCUS + Command

COMMAND	"C4B" [CR]	
Detail	Adjust focus of screen image (sharp and clear) with a long-focal-length (∞) (the lens direction is backward) The same operation as "FOCUS △" button of the remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.36 FOCUS – Command

COMMAND	"C4A" [CR]	
Detail	Adjust focus of screen image (sharp and clear) with a short-focal-length (the lens direction is forward) The same operation as "FOCUS ▽" button of the remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.37 LENS SHIFT UP Command

COMMAND	"C5D" [CR]	
Detail	Move screen image Up by Lens Shift function	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.38 LENS SHIFT DOWN Command

COMMAND	"C5E" [CR]	
Detail	Move screen image Down by Lens Shift function	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.39 LENS SHIFT LEFT Command

COMMAND	"C5F" [CR]	
Detail	Move screen image to the left by Lens Shift function	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.40 LENS SHIFT RIGHT Command

COMMAND	"C60" [CR]	
Detail	Move screen image to the right by Lens Shift function	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.41 FULL LAMP MODE SET Command

COMMAND	"C70" [CR]	
Detail	Set all lamps to ON When switching to 1 lamp from all lamps then to all lamps again, or switching to all lamps from 1 lamp then to 1 lamp again, it is unable to switch for 90 seconds for the light preparation.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.42 HALF LAMP MODE 1 SET Command

COMMAND	"C71" [CR]	
Detail	Set to HALF LAMP MODE（1 lamp mode） Lamp No.1 is set. Usually when Half Lamp Mode is set, the projector automatically chooses lamps, but with this command, Lamp No.1 is first chosen. This function can be used for White Balance adjustment and color correction. When switching to 1 lamp from all lamps then to all lamps again, or switching to all lamps from 1 lamp then to 1 lamp again, it is unable to switch for 90 seconds for the light preparation.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.43 HALF LAMP MODE 2 SET Command

COMMAND	"C72" [CR]	
Detail	Set to HALF LAMP MODE（1 lamp mode） Lamp No.2 is set. Usually, when Half Lamp Mode is set, the projector automatically chooses lamps, but with this command, Lamp No.2 is first chosen. This function can be used for White Balance adjustment and color correction. When switching to 1 lamp from all lamps then to all lamps again, or switching to all lamps from 1 lamp then to 1 lamp again, it is unable to switch for 90 seconds for the light preparation.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.44 AUTO PC ADJ. Command

COMMAND	"C89" [CR]	
Detail	Execute AUTO PC ADJ. function This command works the same as "AUTO PC" button of the remote control. While Auto PC Adj. is working and a computer issues another command, Auto PC Adj. stops. This is the same function as "AUTO PC" button of the remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.45   PRESENTATION TIMER Command

COMMAND	"C8A" [CR]	
Detail	Start timer to count time for presentation This command works the same as "P-TIMER" button of the remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.46   KEYSTONE ↑ Command

COMMAND	"C8E" [CR]	
Detail	Correct keystone distortion by reducing upper part of image	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.47   KEYSTONE ↓ Command

COMMAND	"C8F" [CR]	
Detail	Correct keystone distortion by reducing lower part of image.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.48   KEYSTONE → Command

COMMAND	"C90" [CR]	
Detail	Correct keystone distortion by reducing right part of image Not available for LC-SX6 (SXGA+ model) as this is not installed.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.49   KEYSTONE ← Command

COMMAND	"C91" [CR]	
Detail	Correct keystone distortion by reducing left part of image. Not available for LC-SX6 (SXGA+ model) as this is not installed.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

7. Status Read Command

7.1 Format

7.1.1 PC issues commands in format as below.

"CR" COMMAND [CR]

Command: one character (See Status Read Command Table)

7.1.2 When a projector receives the appropriate command, it returns a character line as the required data.
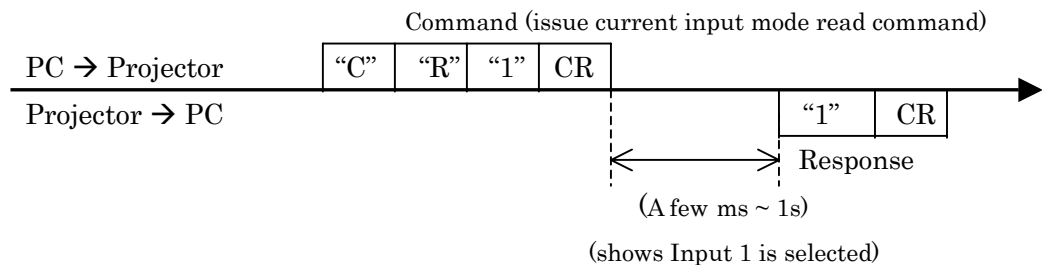
Required Data [CR]

Required Data: A character line (See Status Read Command Table)

7.1.3 When the received data cannot be decoded, the projector returns "?" [CR].

7.2 Transfer Example

Get input mode for projector by basic commands.

Command (issue current input mode read command)

| PC → Projector | "C" | "R" | "1" | CR |

| Projector → PC | "1" | CR |

Response

(A few ms ~ 1s)

(shows Input 1 is selected)

7.3 Status Read Command

COMMAND	"CR0" [CR]
Detail	Get the projector status
Response	Acceptable	"%1" [CR]
	%1	"00" = Power ON "80" = Standby "40" = Processing Countdown "20" = Processing Cooling Down "10" = Power Failure "28" = Processing Cooling Down due to abnormal temperature "88" = Standby after Cooling Down due to abnormal temperature "02" = Invalid RS-232C Command "24" = Processing Power Save / Cooling Down "04" = Power Save "21" = Processing Cooling Down after Off due to lamp failure "81" = Standby after Cooling Down due to lamp failure "2C" = Processing Cooling Down after Off due to Shutter management "8C" = Standby after Cooling Down due to Shutter management
	Unacceptable	"?" [CR]

[Details for Response]

7.3.1 "00" [CR]

Status: Power ON

Normal image is on-screen.

7.3.2 "80" [CR]

Status: Standby

When the status is Standby, Status Read Commands are always acceptable, but Functional Execution Commands are not acceptable except Power ON Command.

7.3.3 "40" [CR]

Status: Processing Countdown

When "Display" in Setting menu is ON and POWER ON is executed, it starts processing Countdown.

When "Display" in Setting menu is OFF, processing Countdown is canceled and the status moves to Power ON.

7.3.4 "20" [CR]

Status: Processing Cooling Down

When the status is Power ON and Power OFF Command ("C01"[CR]) is executed, it moves to Cooling Down. This status automatically moves to Standby when lamp is turned off and the fan spin finishes after about 90 seconds. (The fan spin time depends on models.)

This function is used to cool down lamps and other optical parts, and is quite important to projector's liability. During this time, Functional Execution Commands are invalid.

7.3.5 "10" [CR]

Status: Power Failure

When the power supply voltage inside the projector reaches abnormal status, the projector is automatically turned off. The projector returns "10"[CR], which shows it moves to Power OFF status due to power failure.

Fan also stops unlike Cooling Down status.

7.3.6 "28" [CR]

Status: Processing Cooling Down due to abnormal temperature

When the inside temperature is out of the operating temperature, it automatically starts Cooling Down. Response for this status is "28"[CR].

Even if the temperature decreases during this process, Cooling Down is executed and it moves to Standby mode. The response command "28" stays.

7.3.7 "88" [CR]

Status: Standby after Cooling Down due to abnormal temperature

The projector status is restored from abnormal temperature.

When the status moves to Standby after Cooling Down due to abnormal temperature, it returns "88" [CR].

This shows the status turns to Standby because of abnormal temperature.

This status stays until next operation is done. When Power ON is executed, the information of abnormal temperature is canceled and normal operation is executed.

7.3.8   "02" [CR]

Status: RS-232C Commands are invalid.

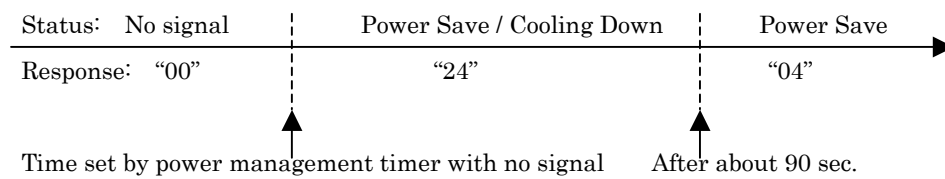When receiving this response, re-send Status Read Command.

7.3.9   "24" [CR]

Status: Processing Power Save / Cooling Down

Power management function in the Setting menu works and the status goes to Power Save / Cooling Down.

During this time, Functional Execution Commands are invalid.

The status moves to Power Save at set hours after the operation of Cooling Down.

Status: No signal   Power Save / Cooling Down   Power Save

Response: "00"   "24"   "04"

Time set by power management timer with no signal   After about 90 sec.

7.3.10   "04" [CR]

Status: Power Save

This shows it moves to Power Save status by Power management function in the Setting menu.

7.3.11   "21" [CR]

Status: Processing Cooling Down after Off due to lamp failure

When a projector is turned off because of lamp failure, it starts Cooling Down. It returns "21" [CR]. The response command "21" [CR] stays during Cooling Down.

7.3.12   "81" [CR]

Status: Standby after Cooling Down due to lamp failure

The projector status is restored from lamp failure.

When the status moves to Standby after Cooling Down due to lamp failure, it returns "81". This shows the status turns to Standby because of lamp failure. This status stays until next operation is done.

When Power ON is executed, the information of lamp failure is canceled and normal operation is executed.

7.3.13   "2C" [CR]

Status: Processing Cooling Down after Off due to Shutter management

This shows the status is Cooling Down because of Shutter management function in the Setting menu. During this time, Functional Execution Commands are invalid.

7.3.14   "8C" [CR]

Status: Standby after Cooling Down due to Shutter management

When the status moves to Standby after Cooling Down due to Shutter management, it returns "8C" [CR]. This shows the status turns to Standby because of Shutter management. This status stays until next operation is done.

When Power ON is executed, the information of Shutter management is canceled and normal operation is executed.

7.4   Input Mode Read Command

COMMAND	"CR1" [CR]	
Detail	Get the selected Input.	
Response	Acceptable	"%1" [CR]
	%1	"1" = Input 1 is selected. "2" = Input 2 is selected. "3" = Input 3 is selected. "4" = Input 4 is selected. "5" = Input 5 is selected.
	Unacceptable	"?" [CR]

7.5   Lamp Time Read Command

COMMAND	"CR3" [CR]	
Detail	Get the total lamp running hours.	
Response	Acceptable	"%1_%2" [CR]

	%1, %2	There is lamp 1 data, once space, and lamp 2 data.
		%1 = lamp No.1
		%2 = lamp No.2
		Example:
		"00410_00410" [CR]
		     --→ Lamp No.1 = 410 Hours
		          Lamp No.2 = 410 Hours

	Unacceptable	"?" [CR]

7.6   Setting Read Command

COMMAND	"CR4" [CR]	
Detail	Get the screen setting status such as Ceiling/Rear.	
Response	Acceptable	"%1" [CR]

	%1	"11" [CR] = Normal Screen Setting
		"10" [CR] = Picture is top/bottom reversed.
		                (Status: Rear & Ceiling ON)
		"01" [CR] = Picture is left/right reversed. (Status: Rear ON)
		"00" [CR] = Picture is top/bottom and left/right reversed.
		                (Status: Ceiling ON)

	Unacceptable	"?" [CR]

7.7　Temp. Read Command

COMMAND	"CR6" [CR]
Detail	Get the temperature data inside a projector. With some temperature sensors installed in the projector, it is possible to get the temperature all at once.

Response		
	Acceptable	"%1_%2_%3_%4" [CR]
	%1 %2 %3 %4	%1 = Temperature of sensor 1 (External temp) %2 = Temperature of sensor 2 (Internal temp. 1) %3 = Temperature of sensor 3 (Internal temp. 2) %4 = Temperature of sensor 4 ("_XX.X" Fixed) Temperature data form shows as 00.0. When the temperature sinks to -, the first character is "-" like "-05.5" [CR]. When no temperature data returns due to hardware problems, the first character is "E" like "E00.0" [CR]. When the status is Standby or it is 10 seconds after Power On, depending on projectors, temperature may approach the abnormal status due to ballast lamp's residual heat. So, when the status is Standby or it is 10 seconds after Power On, the process for the abnormal temperature is not executed. The temperature data is "　----" at the time. Because %4 indicates the sensor 4 data which can only detect two states of "Normal" or "Abnormal", the temperature is shown as "_XX.X". With some temperature sensors installed, the projector sends commands continuously. "　31.5　　35.2　　38.5　　XX.X" [CR] There is the sensor 1 data, one space, the sensor 2 data…
	Unacceptable	"?" [CR]

7.8　Lamp Mode Read Command

COMMAND	"CR7" [CR]
Detail	Get Lamp Mode for multiple-lamp projector. It is possible to get Lamp Mode for multiple-lamp projector. When lamp failure occurs, get the information too.

Response		
	Acceptable	"%1" [CR]
	%1	Example: "0F"[CR] First digit indicates Lamp Mode. 　0 = 2 lamps Mode 　1 = 1 lamp Mode (Lamp No.1) 　2 = 1 lamp Mode (Lamp No.2) Second digit indicates if the lamp is ON or OFF. Data is shown as "0-9"and "A-F" which is regarded as 4 bit data. Assign each bit for each lamp information. Example: 　0 = ALL OFF 　1 = No.1 is ON, the other is OFF 　2 = No.2 is ON, the other is OFF 　3 = ALL ON
	Unacceptable	"?" [CR]

7.9   PC Type Read Command

COMMAND	"CR9" [CR]	
Detail	Get the current displayed PC Type.	
Response	Acceptable	"%1" [CR]
	%1	"Stand_by" - Standby "AV_Mode" - AV Mode Current Table such as "UXGA1". - - - - - - PC Mode "Mode1~50" - - - - - - - - - - - - - - - - - - - Mode1~20 "Go_PC_adj." - - - - - - - - - - - - - - - - - - - Auto "No_signal" - - - - - - - - - - - - - - - - - - - No signal
	Unacceptable	"?" [CR]

7.10   Status 2 Read Command

COMMAND	"CRA" [CR]	
Detail	Get the operating status of Shutter & Sound Mute	
	Acceptable	"%1" [CR]
		Return hexadecimal digit of 1 byte as a two-figure character line. Hexadecimal digit is regarded as eight bits and each bit is defined as below. ＋＋＋＋　＋＋＋＋ Bit 0: Shutter ON/OFF 　　　　(ON = 1, OFF = 0) Bit 1: Sound Mute ON/OFF 　　　　(ON = 1, OFF = 0) Bit 2: Spare Bit 3: Spare Bit 4: Spare Bit 5: Spare Bit 6: Spare Bit 7: No Signal=1, Signals=0 Example: 　1) When Shutter is ON: ++++ +++1 　　　Sound Mute ON: ++++ ++11 → "03" 　　　Sound Mute OFF: ++++ ++01 → "01" 　　　There is no signal: 1+++ +++1 → "81" 　2) When Shutter is OFF: ++++ +++0 　　　Sound Mute ON: ++++ ++10 → "02" 　　　Sound Mute OFF: ++++ ++00 → "00" 　　　There is no signal: 1+++ +++0 → "80" When in Standby mode or processing Cooling Down, it returns "FF" [CR].
	Unacceptable	"?" [CR]

8. Command with Address Specification

8.1   Overview

8.1.1   Commands with address are used to remote control multiple projectors through RS-232C by one computer.

8.1.2   The command with address is defined one command/one line that starts with "A" and ends with carriage return (0x0D).

8.1.3   When a projector receives carriage return (0x0D), it starts decoding.

8.1.4   This command is represented Basic Command or Expand Command with address such as "A001".

> (Ex) Functional Execution Command
>
> > "A001C05"[CR]
>
> (Ex) Status Read Command
>
> > "A001CR0"[CR]

8.1.5   Projector has a function to set up its address in "SPECIAL" – "RS-232C" – "Projector ID" in the menu.

> Initial setting is "No. 001"
>
> Possible range is "001" to "999"

8.1.6   It clears the received buffer in the case as below.

- When receiving LF (0xoA) or EOF (0x1A)
- When it takes more than one second to receive one command.

(When it takes more than 1 second to receive carriage return since the projector has received the first data.)

8.1.7   Wait the interval up to 60 ms for the response.

8.2   Functional Execution Command with address

8.2.1 Format

1) PC issues commands in format as below:

"A" Address "C" Command [CR]

or

"C" Address "CF□" Command "□" Parameter [CR]

> Address: 3-digit number ("001"-"999")
>
> > Commands with "FFF" as the address are available for all projectors.
>
> Command: Character line (See Basic Command or Expand Command)

2) The only projector with the appropriate address decodes received commands, and when it is ready to receive next commands, it returns the response.

[ACK] [CR]: When receiving Functional Execution Command (0x06, 0x0D)

"?" [CR]: When the received data cannot be decoded

However, when address is "FFF", it executes the function but does not return the response.

8.2.2   Command Pipelining

When it needs command pipelining, the operation is the same as the remote control.

1) PC issues commands every 100 ms

2) When receiving the appropriate command, projector executes it continuously for 120 ms.

3) When receiving the same command in 120 ms, the projector executes it continuously for another 120 ms from the moment.

4) When there is no command after 120 ms, this execution is stopped.

5) When receiving other commands in 120 ms, this execution is stopped.

8.3   Status Read Command with Address

8.3.1   Format

1) PC issues commands in format as below:

"A" Address "CR" COMMAND [CR]

<div align="center">or</div>

"A" Address "CR_" COMMAND [CR]

Address: 3 digits number ("001"-"999")

Command: Character line (See Basic Command or Expand Command)

2) The only projector with the appropriate address decodes received commands and returns the character line as the required data.

Required Data [CR]

Required Data: Character Line (See Basic Status Read Command)

3) When the received data cannot be decoded, it returns "?" [CR].