BASIC SERIAL COMMAND

FUNCTIONAL SPECIFICATIONS

EIKI

LC-HDT2000

Ver.1.00

Contents

1   Overview

This specification defines projector control commands for the LC-HDT2000

The projector control commands are designed to remote-control a projector through RS-232C from a computer.

Refer to [8. Command with Address Specification] when using commands with address.

2   Serial Interface Specification

2.1   Transfer Specification

Items	Specification
Synchronous system	Asynchronous
Transmission Speed	9600 / 19200
Data Length	8 bits
Parity	None
Stop Bit	1
Flow Control	None

1)   Transmission speed: initial setting value is 19200.

2)   Transmission speed can be changed in Service Mode.

2.2   Connection

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

PC   Projector
COM 1   Serial Port IN

(D-Sub 9Pin)   (D-Sub 9Pin)
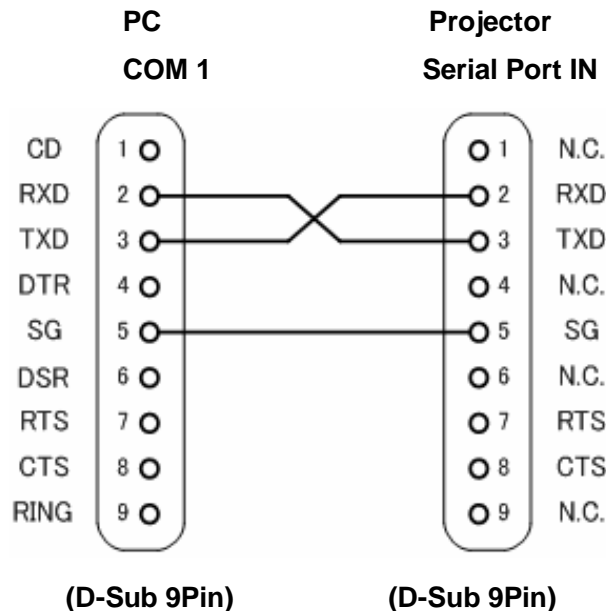
Connect COM port of the computer to SERIAL PORT IN of the projector.

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

3   Notes for Communication

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

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

There are two types of command, Functional Execution Commands and Status Read Commands.

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

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

It clears the information of buffer in the following cases.

- When the projector receives LF (0x0A) or EOF (0x1A9).

- When it takes more than one second to receive a single command.

   (Until receiving the carriage return after the reception of the first data.)

When pipelining control commands, allow interval time as below after the reception of response.

   1) [ZOOM UP/DOWN] [FOCUS UP/DOWN] [LENS SHIF UP/DOWN/LEFT/

   RIGHT] commands…100ms

   2) Other commands…500ms

When pipelining Status Read command, allow at least 500ms of interval time after the response.

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

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

For 7 seconds after starting POWER ON in the status of STANDBY, the projector returns "Acceptable" response, but it does not carry out the command.   Status Read commands are carried out in 500 ms after the "Acceptable" response is returned.

About the behavior during Count Down and Cooling Down operation; in the period of the Count Down operation after Power ON or Cooling Down after Power OFF, "Acceptable" response is returned, but the command is not carried out except for Status Read command.

About the behavior during switching inputs; it takes 5 seconds to switch inputs after receiving the command. During this period, even if another command is received, it is not carried out although returning "Acceptable" response.   However, Status Read commands are carried out in 500 ms after the "Acceptable" response is returned.

The length of the returned value for Status Read command in successful operation depends on the command.

The characters for commands must be in uppercase (A - Z). Those in lowercase can not be used

4 Functional Execution Command Table

Command	Item	Command	Item
C00	POWER ON	C43	FREEZE ON
C01	POWER OFF (Immediate POWER OFF)	C44	FREEZE OFF
C05	INPUT 1	C46	ZOOM -
C06	INPUT 2	C47	ZOOM +
C07	INPUT 3	C4A	FOUCS -
C08	INPUT 4	C4B	FOUCS +
C0D	VIDEO MUTE ON	C5D	LENS SHIFT UP
C0E	VIDEO MUTE OFF	C5E	LENS SHIFT DOWN
C0F	SCREEN NORMAL SIZE	C5F	LENS SHIFT LEFT
C10	SCREEN FULL SIZE	C60	LENS SHIFT RIGHT
C1C	MENU ON	C89	AUTO PC ADJ.
C1D	MENU OFF	C8A	PRESENTATION TIMER
C1E	DISPLAY CLEAR	C8B	PRESENTATION TIMER (Exit)
C27	IMAGE	C8E	KEYSTONE ↑
C30	D.ZOOM +	C8F	KEYSTONE ↓
C31	D.ZOOM -	C90	KEYSTONE →
C3A	POINTER RIGHT	C91	KEYSTONE ←
C3B	POINTER LEFT		
C3C	POINITER UP		
C3D	POINITER DOWN		
C3F	ENTER		

5 Status Read Command Table

Command	Item
CR0	Status Read
CR1	Input Mode Read
CR3	Lamp Time Read
CR4	Setting Read
CR6	Temp. Read
CR7	Lamp Mode Read

6   Functional Execution Command

6.1   Format

1) PC issues a command in the format below:

"C" Command [CR]

Command: two characters (Refer to Functional Execution Command Table)

2) A projector decodes the received data and returns the result after getting ready to receive another command.

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

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

6.2   Command Pipelining

Functions which need command pipelining follow the rule below.

- Sender system issues any command every 100ms.

- When receiving the applicable command, the function is executed for 120ms from the moment.

- When receiving the same command in succession within 120ms, the function is executed for another 120ms from the moment.

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

- When the projector receives incoming other command within 120ms, the execution of pipelining is stopped.

6.3   Transfer Example

Changing input to INPUT3 with Basic Command.

```
                                          Command
PC → Projector  _____| "C" | "0" | "7" | CR |_____>
Projector → PC  _____| ACK | CR |_____>
                                                        Processing
                                                     (a few ms – 1s)
```
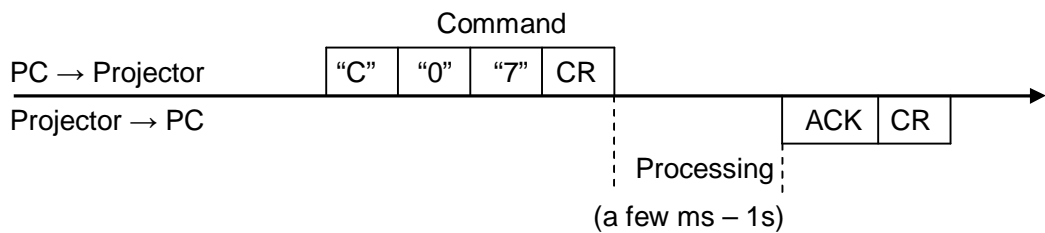
6.4   Operation Requirements

When the projector is in the status below, Functional Execution Commands are limited.

(Status Read Commands are available in following status)

Projector Status	Available Functional Execution Commands
In Standby status	C00: POWER ON
Count Down in process	C00: POWER ON (Countdown is terminated)
Cooling Down in process	NONE (No Execution)
Cooling Down in process due to abnormal temperature	NONE (No Execution)
In Abnormal Temperature	NONE (No Execution)
In Abnormal Power Status	NONE (No Execution)
On switching modes	NONE (No Execution)
Power Saving Cooling Down in process	NONE (No Execution)
In Power Saving status	C00: POWER ON C01: POWER OFF

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

6.5   POWER ON Command

COMMAND	"C00" [CR]	
Detail	Power ON When already Power is ON, no operation starts. When sending this command during Count Down in process, Count Down process is terminated.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.6   POWER OFF Command (Immediate POWER OFF)

COMMAND	"C01" [CR]	
Detail	Power OFF (Standby) When Power is turned OFF with ON/STAND-BY button of the projector and remote control, "Power OFF" is displayed. In contrast, this command executes immediately Power OFF.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.7   INPUT 1 Command

COMMAND	"C05" [CR]	
Detail	Select Input 1 Note) When there is no board inserted to Input 1, it is not executed.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.8   INPUT 2 Command

COMMAND	"C06" [CR]	
Detail	Select Input 2 Note) When there is no board inserted to Input 2, it is not executed.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.9   INPUT 3 Command

COMMAND	"C07" [CR]	
Detail	Select Input 3 Note) When there is no board inserted to Input 3, it is not executed.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.10   INPUT 4 Command

COMMAND	"C08" [CR]	
Detail	Select Input 4 Note) When there is no board inserted to Input 4, it is not executed.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.11   VIDEO MUTE ON Command

COMMAND	"C0D" [CR]	
Detail	Video Mute ON This command works the same way as "SHUTTER" button of the remote control, but it works only for Shutter Open, not for Shutter Close.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.12   VIDEO MUTE OFF Command

COMMAND	"C0E" [CR]	
Detail	Video Mute OFF This command works the same way as "SHUTTER" button of remote control, but it works only for Shutter Close, not for Shutter Open.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.13   SCREEN NORMAL SIZE Command

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

6.14   SCREEN FULL SIZE Command

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

6.15   MENU ON Command

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

6.16   MENU OFF Command

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

6.17   DISPLAY CLEAR Command

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

6.18   IMAGE Command

COMMAND	"C27" [CR]	
Detail	Switch Image setting. In the case of the projector and remote control possessing an "IMAGE" button, this command work as an "IMAGE" function.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.19   D.ZOOM + Command

COMMAND	"C30" [CR]	
Detail	Enter Digital Zoom mode and expand image size. This command works the same way as "D.zoom" button of remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.20   D.ZOOM – Command

COMMAND	"C31" [CR]	
Detail	Enter Digital Zoom mode and compress image size. This command works the same way as "D.zoom" button of remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.21   POINTER RIGHT Command

COMMAND	"C3A" [CR]	
Detail	Move Pointer of On Screen Display Menu to the right This command works the same way as "►" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.22   POINTER LEFT Command

COMMAND	"C3B" [CR]	
Detail	Move Pointer of On Screen Display Menu to the left This command works the same way as "◄" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.23   POINTER UP Command

COMMAND	"C3C" [CR]	
Detail	Move Pointer of On Screen Display Menu upward. This command works the same way as "▲" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.24   POINTER DOWN Command

COMMAND	"C3D" [CR]	
Detail	Move Pointer of On Screen Display Menu downward. This command works the same way as "▼" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.25   ENTER Command

COMMAND	"C3F" [CR]	
Detail	This command works the same way as "SELECT" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.26   FREEZE ON Command

COMMAND	"C43" [CR]	
Detail	Freeze on-screen picture This command works the same way as "FREEZE" button of the remote control, but it works only for turning on, not for turning off Freeze.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.27   FREEZE OFF Command

COMMAND	"C44" [CR]	
Detail	Cancel Freeze function This command works the same way as "FREEZE" button of the remote control, but it works only for turning off, not for turning on Freeze.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.28   ZOOM + Command

COMMAND	"C47" [CR]	
Detail	Make screen image larger This command works the same way as "ZOOM▲" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.29   ZOOM – COMMAND

COMMAND	"C46" [CR]	
Detail	Make screen image smaller This command works the same as "ZOOM ▼" button of the projector and remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.30   FOCUS + Command

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

6.31   FOCUS – Command

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

6.32   LENS SHIFT UP Command

COMMAND	"C5D" [CR]	
Detail	Move screen image upward	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.33   LENS SHIFT DOWN Command

COMMAND	"C5E" [CR]	
Detail	Move screen image downward	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.34   LENS SHIFT LEFT Command

COMMAND	"C5F" [CR]	
Detail	Move screen image to the left.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.35   LENS SHIFT RIGHT Command

COMMAND	"C60" [CR]	
Detail	Move screen image to the right.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.36   AUTO PC ADJ. Command

COMMAND	"C89" [CR]	
Detail	Execute Auto PC Adj. function This command works the same way as "AUTO PC" button of the projector and remote control. When this command is received during Auto PC Adj. operation, the operation is stopped.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.37　PRESENTATION TIMER Command

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

6.38　PRESENTATION TIMER (Exit) Command

COMMAND	"C8B" [CR]	
Detail	Exit P-Timer function. This command works the same way as pressing and hold "P-TIMER" button of the remote control.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.39　KEYSTONE ↑ Command

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

6.40　KEYSTONE ↓ Command

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

6.41　KEYSTONE → Command

COMMAND	"C90" [CR]	
Detail	Correct keystone distortion by reducing right part of image.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.42　KEYSTONE　　　Command

COMMAND	"C91" [CR]	
Detail	Correct keystone distortion by reducing left part of image.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

7   Status Read Command

7.1   Format

1) PC issues a command in the format below:

"CR" Command [CR]

Command: Single character (Refer to Status Read Command Table)

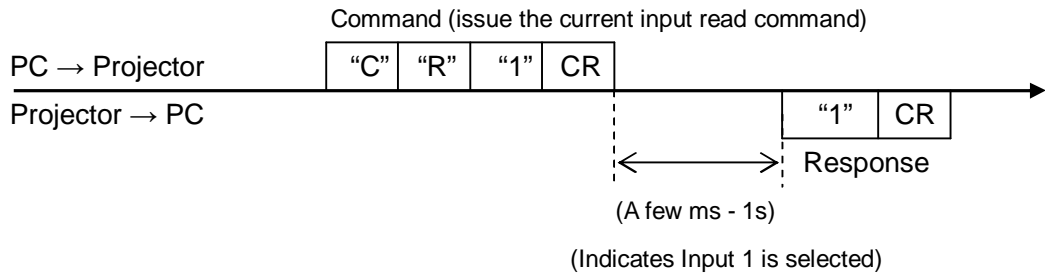2) When a projector receives the appropriate command, it returns the required information as a data string.

Required Data [CR]

Required Data: String (Refer to Status Read Command Table)

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

7.2   Transfer Example

Get the selected input for the projector by Basic Commands.

Command (issue the current input read command)

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

Projector → PC | "1" | CR |
Response

(A few ms - 1s)

(Indicates 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" = Countdown in process
		"20" = Cooling Down in process
		"10" = Power Failure
		"28" = Cooling Down due to Abnormal Temperature in process
		"24" = Power Management Cooling Down in process
		"04" = Power Management status
		"21" = Cooling Down in process after Off due to lamp failure
		"81" = Standby after Cooling Down due to lamp failure
		"88" = Standby after Cooling Down due to
		      Abnormal Temperature
		"2C" = Cooling Down in process after Power Off due to
		      Shutter management
		"8C" = Standby after Cooling Down due to
		      Shutter management

	Unacceptable	"?" [CR]

Details for Response

"00" [CR]

Status: Power ON

Normal image is on screen.

"80" [CR]

Status: Standby

When the status is Standby, Status Read Commands are always accepted, but Functional

Execution Commands are not accepted except POWER ON Command.

"40" [CR]

Status: Countdown in process

When "Display" in Setting menu is set to ON, execution of Power ON operation brings into

Countdown status.

When "Display" in Setting menu is set to OFF, the status jumps to Power ON without

Countdown operation.

"20" [CR]

Status: Cooling Down in process

Execution of POWER OFF Command ("C01" [CR]) in power on status brings into Cooling

Down status.

This status automatically moves to Standby when the lamp is turned off and the fan spin

finishes after about 90 seconds (the time of spinning fan depends on models).

During this time, Functional Execution Commands are not accepted.

"10" [CR]

Status: Power Failure

When the power supply voltage inside the projector reaches abnormal level, the status automatically moves to Power OFF.

Abnormal power supply voltage includes;

- Filter abnormal status
- Shutter abnormal status

The projector returns "10" [CR], which indicates the status moves to Power OFF due to power failure. Fan also stops.

"28" [CR]

Status: Cooling Down due to Abnormal Temperature in process.

When the internal temperature rises abnormally, it automatically starts Cooling Down process. Response value for this status is "28" [CR].

Even if the temperature comes down during this process, the given Cooling Down process is executed and it moves to Standby status.

"24" [CR]

Status: Power Management Cooling Down in process.

When Power Management function in setting menu is set to ON, continuous 5 minutes of no signal status leads to turning off lamps and starting Cooling Down operation (Green LED on the projector body is turned off).

During this period, any Functional Execution Command cannot be accepted.

The Power Management Cooling Down operation continues about 90 seconds, then the status moves to Power Management.

Status:	No signal	Power Management Cooling Down	Power Management
Response:	"00"	"24"	"04"
		5 minutes of no signal status	After about 90 sec.
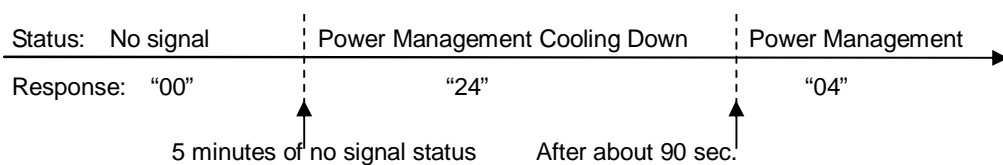
"04" [CR]

Status: Power Management

This indicates it has moved to Power Management status according to the setting of Power Management function in Setting menu.

"21" [CR]

Status: Cooling Down in process after turned off due to lamp failure

When a projector is turned off because of lamp failure, it automatically starts Cooling Down operation, in which the projector returns "21" [CR].

"81" [CR]

Status: Standby after Cooling Down due to lamp failure

This value is returned when Cooling Down operation due to lamp failure has been completed and the status has been moved to Standby. The status is kept until the next operation starts.

"88" [CR]

Status: Standby after Cooling Down due to Abnormal Temperature

This value is returned when Cooling Down operation due to Abnormal Temperature has been completed and the status has been moved to Standby. The status is kept until the next operation starts.

"2C" [CR]

Status: Cooling Down in process due to Shutter management function

This indicates it has moved to Cooling down status according to the setting of Shutter Management function in setting menu. During this time, Functional Execution Commands are not accepted.

"88" [CR]

Status: Standby after Cooling Down due to Shutter management function

This value is returned when Cooling Down operation due to Shutter management has been completed and the status has been moved to Standby. The status is kept until the next operation starts. When projector is turned on again, it cancels the last status and starts normal operation.

7.4   Input Mode Read Command

COMMAND	"CR1" [CR]	
Detail	Get currently selected SLOT	
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 (In the case SLOT method, SLOT 1~4 is selected.)
	Unacceptable	"?" [CR]

7.5   Lamp Time Read Command

COMMAND	"CR3" [CR]	
Detail	Get total lamp running hours	
Response	Acceptable	"%1_%2" [CR]
	%1, %2	Each lamp data follows in sequence with one space between each of them. %1 = lamp No.1 %2 = lamp No.2 ex; "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 screen setting status of 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 information inside projector With more than one temperature sensors installed in the projector, it is possible to get all temperatures at once.	
Response	Acceptable	"%1　%2" [CR]
	%1　%2	%1 = temperature at Sensor 1 %2 = temperature at Sensor 2 Temperature data is expressed as "00.0". When the temperature goes under 0, 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]. With more than one temperature sensors installed, the projector returns the values in series. Ex) "_31.5_ _35.2" [CR] Each sensor data follows in sequence with one space between each of them.
	Unacceptable	"?" [CR]

7.8　Lamp Mode Read Command

COMMAND	"CR7" [CR]	
Detail	Get current Lamp Mode in the multiple-lamp projector. When there is any fail lamp, also can get the information about.	
Response	Acceptable	"%1" [CR]
	%1	ex: "0F"[CR] The first digit indicates Lamp Mode. 　0 = 4-lamps Mode 　1 = 2-lamps Mode (Lamp No.1 and No.4 used) 　2 = 2-lamps Mode (Lamp No.2 and No.3 used) 　3 = 3-lamps Mode (Lamp No.1, No.2 and No.3 used) 　4 = 3-lamps Mode (Lamp No.1, No.2 and No.4 used) 　5 = 3-lamps Mode (Lamp No.1, No.3 and No.4 used) 　6 = 3-lamps Mode (Lamp No.2, No.3 and No.4 used) The second digit indicates if the lamp is ON or OFF. Data is shown as "0-9" and "A-F", which is described in 4-bit data. Assign each bit for each lamp data. ex:　0 = All lamps are OFF 　1 = No.1 is ON, the others are OFF 　2 = No.2 is ON, the others are OFF 　4 = No.3 is ON, the others are OFF 　8 = No.4 is ON, the others are OFF 　3 = No.1 and No.2 are ON, the others are OFF 　5 = No.1 and No.3 are ON, the others are OFF 　9 = No.1 and No.4 are ON, the others are OFF 　6 = No.2 and No.3 are ON, the others are OFF 　A = No.2 and No.4 are ON, the others are OFF 　C = No.3 and No.4 are ON, the others are OFF 　7 = No.1, No.2 and No.3 are ON, the other is OFF 　B = No.1, No.2 and No.4 are ON, the other is OFF 　D = No.1, No.3 and No.4 are ON, the other is OFF 　E = No.2, No.3 and No.4 are ON, the other is OFF 　F = All lamps are ON
	Unacceptable	"?" [CR]

8 Command with Address Specification

8.1 Overview

- Commands with address are used to control more than one projector remotely through RS-232C by a single computer.
- The command with address is defined as a single command per line that starts with "A" and ends with carriage return (0x0D).
- When a projector receives carriage return (0x0D), it starts decoding.
- The address such as "A001" is prefixed to the Basic Serial Command or Expand Serial Command already mentioned.

  e.g.) Functional Execution Command: "A001C05" [CR]

  e.g.) Status Read Command: "A001CR0" [CR]

- Projector has the function to set up its own address in Service mode.

  Initial setting is "No. 001"

  Available range of the value is "001" to "999"

- It clears the data in the receive buffer under following conditions.

  When receiving LF (0x0A) or EOF (0x1A).

  When it takes more than one second to receive a single command.

  (Until receiving a carriage return after the reception of the first data.)

- It returns the response within 60ms.

8.2 Functional Execution Command with address

8.2.1 Format

1) PC issues a command in the format 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 valid to all projectors.

Command: String (Refer to Basic and Expand Serial Commands)

2) The only projector that have the address number matching with the one included in the received data decodes the command, and when it gets ready to receive another command, it returns the response.

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

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

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

8.2.2 When the command pipelining is needed

Functions which need command pipelining follow the rule below.

- Sending-side system issues commands every 100 ms

- When receiving an applicable command, the function is executed repeatedly for 120 ms.

- When receiving the same command in a row within 120 ms, the function is repeatedly executed for another 120 ms from the moment.

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

- When the projector receives other command within 120 ms, the execution of pipelining is stopped.

8.3   Status Read Command with Address

8.3.1 Format

1) PC issues a command in the format below:

"A" Address "CR" Command [CR]

or

"A" Address "CR□" Command [CR]

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

Command: String (Refer to Basic and Expand Serial Commands)

2) The only projectors that have the address matching with the one in the received data decode the command, and it returns required data.

Required Data [CR]

Required Data: String (Refer to Basic Status Read Command Table)

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