

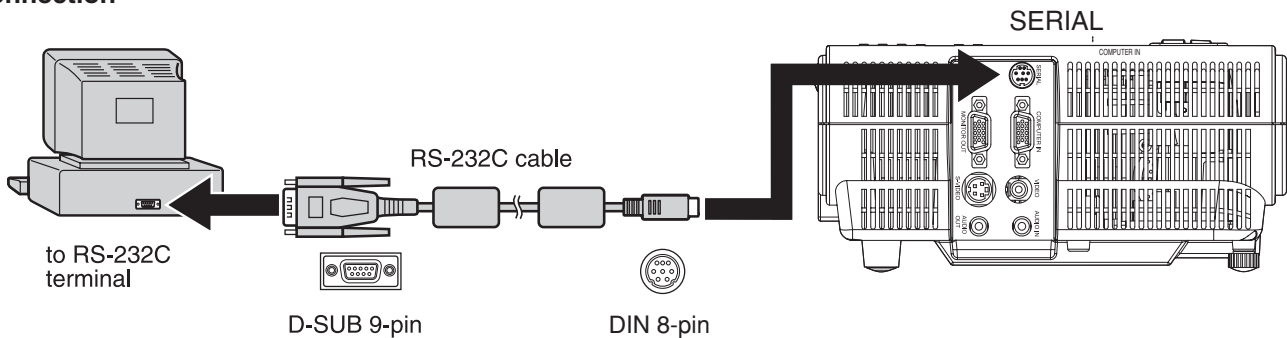
Controlling the projector using a personal computer

This projector can be controlled by connecting a personal computer with RS-232C terminal.

PC-controllable functions :

- Turning the power ON or OFF
- Changing input signals
- Volume, Keystone, Mute, Remote, Reading commands

Connection



Important:

- Make sure that your computer and projector are turned off before connection.
- Boot up the computer first, and then plug the power cord of the projector.
(If you do not follow this instruction, the Comport may not function.)
- RS232C cables may be necessary when you control the projector. Contact your dealer for details.

1) Interface

PROTOCOL	RS-232C
BAUD RATE	9600 [bps]
DATA LENGTH	8 [bits]
PARITY BIT	NONE
STOP BIT	1 [bit]
FLOW CONTROL	NONE

This projector uses RXD, TXD and GND lines for RS-232C control.
For RS-232C cable, the reverse type cable should be used.

2) Control command diagram

The command consists of the address code, function code, data code, and end code. The length of the command varies among the functions.

	Address code	Function code	Data code	End code
HEX	30h 30h	Function	Data	0Dh
ASCII	'0' '0'	Function	Data	↵

- [Address code] 30h 30h (In ASCII code, '0' '0') fixed.
 [Function code] A code of each fixed control move.
 [Data code] A code of each fixed control data (number) and not always indicated.
 [End code] 0Dh (In ASCII code, '↵') fixed.

3) Control sequence

- (1) Send the command from the personal computer to the projector.
 - (2) The projector will send a return command after it receives an end code. If the command is not received correctly, the projector will not send the return command.
 - (3) The personal computer checks the command and confirms if the sent command has been executed or not.
 - (4) This projector sends various codes other than the return code. When having a control sequence by RS-232C, reject other codes from the personal computer.
- During signal switching, the command may not take effect even when the projector sends the return command. After signal switching completes, wait for the mode indication to disappear before sending the next command.
 - When sending commands successively, wait to receive the return command of the current command before sending a next command.
 - Keep intervals of at least 400 ms between receipt of a return command and sending of a next command.

[Example] When turning the power ON (Figures and symbols enclosed in quotation marks are ASCII codes.):

- Any commands will not be executed for 10 seconds after the power is turned on.

Sending commands from the PC, etc.	Status code from the projector	Description
30 30 21 0D '0' '0' '!' '↵'		Command for POWER ON
	30 30 21 0D '0' '0' '!' '↵'	Command receipt confirmation (Command echo back)

4) Operation commands (Not executable in stand-by mode. When the commands for input select are sent while the splash screen is being displayed, the splash screen is only canceled.)

The operation commands are used for the basic operation setting of this projector. They may not be executed while the signals are changed. The operation commands have no data codes.

Operation	ASCII	HEX	Note
POWER ON	!	21h	This command is invalid for 1 minute after the power is turned off.
POWER OFF	"	22h	This command is invalid for 1 minute after the power is turned on.
INPUT COMPUTER	_r1	5Fh 72h 31h	This command will not be executed in Stand-by mode or the MUTE is executed.
INPUT VIDEO	_v1	5Fh 76h 31h	This command will not be executed in Stand-by mode or the MUTE is executed.
INPUT S-VIDEO	_v2	5Fh 76h 32h	This command will not be executed in Stand-by mode or the MUTE is executed.

[Example] When setting the input signal to COMPUTER (Figures and symbols enclosed in quotation marks are ASCII codes.):

Sending commands from the PC, etc.	Status code from the projector	Description
30 30 5F 72 31 0D '0' '0' '_' 'r' '1' '↵'		Command for setting the input signal to COMPUTER
	30 30 5F 72 31 0D '0' '0' '_' 'r' '1' '↵'	Command receipt confirmation (Command echo back)

5) Volume commands (Not executable in stand-by mode. Possible only to read during muting.)

The volume commands are used for the volume setting of this projector with the value.

ITEM	ASCII	HEX	VALUE
VOLUME	VL	56h 4Ch	000 - 100

How to set the grade

Use the ASCII codes to set the grade for setting data. Please refer to the table below for the HEX code.

ASCII	'0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	'8'	'9'
HEX	30h	31h	32h	33h	34h	35h	36h	37h	38h	39h

[Example] When setting the volume to 15 (Figures and symbols enclosed in quotation marks are ASCII codes.):

Sending commands from the PC, etc.	Status code from the projector	Description
30 30 56 4C 30 31 35 0D '0' '0' 'V' 'L' '0' '1' '5' '↵'		Command for setting the volume
	30 30 56 4C 30 31 35 0D '0' '0' 'V' 'L' '0' '1' '5' '↵'	Command receipt confirmation (Command echo back)

6) Keystone commands (Not executable in stand-by mode. Possible only to read during muting.)

The keystone commands are used for the keystone setting of this projector with the value. The value will vary depending on the installation conditions, etc.)

ITEM	ASCII	HEX	VALUE
KEystone(vertical)	KS	4Bh 53h	±20

How to set the grade

Use the ASCII codes to set the grade for setting data. Please refer to the table below for the HEX code.

ASCII	'+'	'-'	'0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	'8'	'9'
HEX	2Bh	2Dh	30h	31h	32h	33h	34h	35h	36h	37h	38h	39h

7) Mute commands (Not executable in stand-by mode. When the mute commands are sent while the splash screen is being displayed, the splash screen is not muted but only canceled.)

The mute commands are used for the mute setting of this projector with the 0(30h) and 1(31h).

ITEM	ASCII	HEX	VALUE
AV MUTE	MUTE	4Dh 55h 54h 45h	0 (OFF), 1 (ON)

8) Remote commands (Not executable in stand-by mode. When the remote commands are sent while the splash screen is being displayed, the splash screen is only canceled.)

Some remote control operations can be achieved by the remote command codes. The remote commands have no data codes.

Button's name on remote	ASCII	HEX
▲	r53	72h 35h 33h
▼	r2b	72h 32h 62h
◀	r4f	72h 34h 66h
▶	r59	72h 35h 39h
MENU	r54	72h 35h 34h
ENTER	r10	72h 31h 30h
AUTO POSITION	r09	72h 30h 39h
FREEZE	ra4	72h 61h 34h
ASPECT	re2	72h 65h 32h

[Example] When displaying the MENU selection bar (Figures and symbols enclosed in quotation marks are ASCII codes.):

Sending commands from the PC, etc.	Status code from the projector	Description
30 30 72 35 34 0D '0' '0' 'r' '5' '4' '↵'		Command operating the same as the MENU button
	30 30 72 35 34 0D '0' '0' 'r' '5' '4' '↵'	Command receipt confirmation (Command echo back)

9) Reading command diagram

The projectors operating status, such as POWER-ON, the currently selected input terminal and lamp operating time, etc. can be monitored.

	ASCII		HEX	
	Function	Data (Receive)	Function	Data (Receive)
POWER ON	vP	"1" when power-on mode "0" when standby mode	76h 50h	31h
INPUT COMPUTER	vl	r1	76h 49h	72h 31h
INPUT VIDEO	vl	v1	76h 49h	76h 31h
INPUT S-VIDEO	vl	v2	76h 49h	76h 32h
LAMP OPERATING TIME (on a LOW mode basis)	vLE	hhhhmm	76h 4Ch 45h	hhhhmm

The PC sends the command without attaching the data code to it. On the other hand, the projector attaches to the received command it's current operating status as the data code and send it back to the PC. (LAMP OPERATING TIME: "h" and "m" represent hour and minute respectively.)

[Example] When checking the currently selected input terminal (when the INPUT VIDEO is being selected) :

Sending commands from the PC, etc.	Status code from the projector	Description
30 30 76 49 0D '0' '0' 'v' '1' '↵'		Command for checking the input terminal
	30 30 76 49 76 31 0D '0' '0' 'v' '1' 'v' '1' '↵'	Check result (VIDEO)