

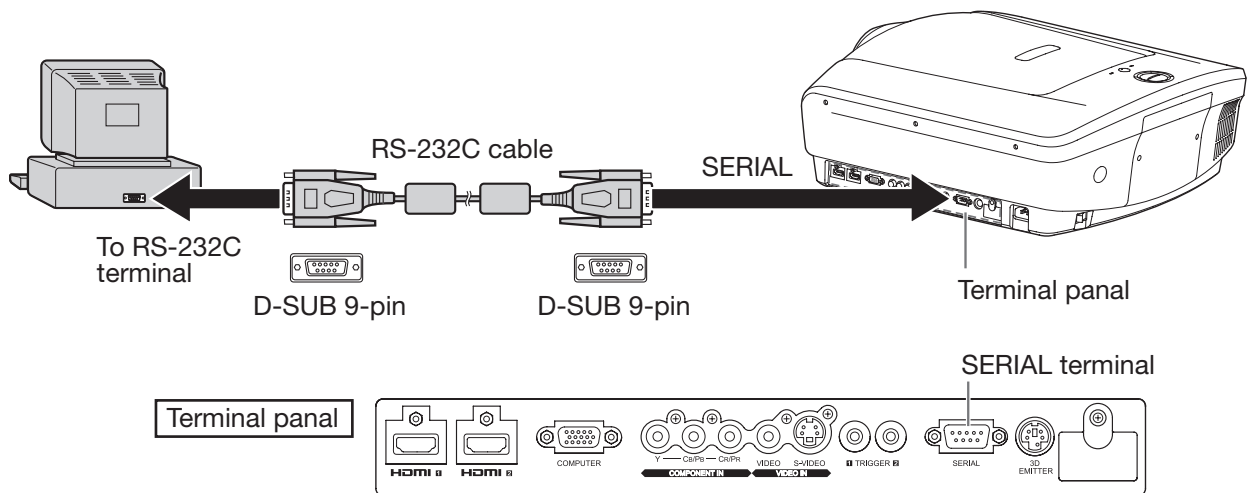
Controlling the projector using a personal computer

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
- Inputting commands by pressing the buttons on the control panel and remote control
- Menu setting

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 Com port may not function.)
- Adapters may be necessary depending on the PC connected to this projector. Contact your dealer for details.

1) Interface

PROTOCOL	RS-232C
BAUD RATE	19200 [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 header, action, function code, data code, and end code. The length of the command varies among the functions.

	Header	Action	Space	Function code	Space	Data code	End code
HEX	4D	3F or 21	20		20		0D
ASCII	M	? or !					↵

3) Control sequence

- (1) Send the command from the personal computer to the projector.
- (2) The projector will send a return command (ACK) after it receives an end code. If the command is not received correctly, the projector will not send the return command (M! NAK ↵).
- (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.
 - Any commands will not be executed until the splash screen is displayed after the power is turned on.

[Example] When changing the input signal to HDMI1.

Sending commands from the PC, etc.	Status code from the projector	Description
4D 21 20 49 4E 50 20 30 0D	4D 21 20 41 43 4B 20 0D	Command for changing the input signal to HDMI1
M! INP 0 ↵	M! ACK ↵	Command receipt confirmation
4D 21 20 49 4E 50 20 30 0D	4D 21 20 4E 41 4B 20 0D	Command for changing the input signal to HDMI1
M! INP 0 ↵	M! NAK ↵	The projector did not receive the command.

4) Operation commands

The operation commands are used for the basic operation setting of this projector. They may not be executed while the signals are changed.

Operation	Action (ASCII)	Action (HEX)	Function (ASCII)	Function (HEX)	Data (ASCII)	Data (HEX)	Note
POWER ON	!	21	PDM	50 44 4D	1	31	This command is invalid for 1 minute after the power is turned off.
POWER OFF					0	30	This command is invalid for 1 minute after the power is turned on.
INPUT HDMI1			INP	49 4E 50	0	30	This command will not be executed in Stand-by mode.
INPUT HDMI2					1	31	This command will not be executed in Stand-by mode.
INPUT COMPONENT					2	32	This command will not be executed in Stand-by mode.
INPUT COMPUTER					3	33	This command will not be executed in Stand-by mode.
INPUT VIDEO					4	34	This command will not be executed in Stand-by mode.
INPUT S-VIDEO					5	35	This command will not be executed in Stand-by mode.

5) Remote commands (Not executable in stand-by mode other than power on and off.)

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

Button's name on remote control	Action (ASCII)	Action (HEX)	Function (ASCII)	Function (HEX)	Data (ASCII)	Data (HEX)	Description
POWER ON					41	34 31	Remote control setting - Power on
POWER OFF					42	34 32	Remote control setting - Power off
AUTO POSITION					A2	41 32	Remote control setting - Auto position
HDMI1					72	37 32	Remote control setting - HDMI1
HDMI2					73	37 33	Remote control setting - HDMI2
PC					60	36 30	Remote control setting - PC
COMP					64	36 34	Remote control setting - COMP
S-VIDEO					66	36 36	Remote control setting - S-Video
VIDEO					65	36 35	Remote control setting - Video
PICTURE MODE					55	35 35	Remote control setting - Picture mode
FRC					56	35 36	Remote control setting - FRC
2D/3D					57	35 37	Remote control setting - 2D/3D
▲					82	38 32	Remote control setting - Up
◀					80	38 30	Remote control setting - Left
ENTER					87	38 37	Remote control setting - Enter
▶	!	21	RMC	52 4D 43	81	38 31	Remote control setting - Right
▼					83	38 33	Remote control setting - Down
MENU					86	38 36	Remote control setting - Menu
IRIS					54	35 34	Remote control setting - Iris
ASPECT					E2	45 32	Remote control setting - Aspect
CONTRAST					D0	44 32	Remote control setting - Contrast
BRIGHTNESS					D1	44 31	Remote control setting - Brightness
COLOR TEMP					D4	44 34	Remote control setting - Color temperature
GAMMA					D5	44 35	Remote control setting - Gamma
SHARPNESS					D6	44 36	Remote control setting - Sharpness
COLOR					D2	44 32	Remote control setting - Color
ZOOM/FOCUS					46	34 36	Remote control setting - Zoom/Focus
LENS SHIFT					47	34 37	Remote control setting - Lens Shift
COLOR MANAGEMENT					B4	42 34	Remote control setting - Color Management
USER					B7	42 37	Remote control setting - User

[Example] When displaying the MENU selection bar.



Sending commands from the PC, etc.	Status code from the projector	Description
4D 21 20 52 4D 43 20 38 36 0D	4D 21 20 41 43 4B 20 0D	Command operating the same as the MENU button
M! RMC 86 [↵]	M! ACK [↵]	Command receipt confirmation

6) Reading command diagram

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

	Action (ASCII)	Action (HEX)	Function (ASCII)	Function (HEX)	Data (Receive) (ASCII)	Data (Receive) (HEX)	Description
Lamp Mode			LPP	4C 50 50	0 : Normal, 1 : High	30, 31	Command for Lamp Mode confirmation
Lamp Time			LPT	4C 50 54	hhhhmm hhh : 0 - 4000, mm : 0 - 59	hhhhmm hhh : 30 -34 30 30 30 mm : 30 - 35 59	Command for Lamp Time confirmation
Input			INP	49 4E 50	0 - 5	30 - 35	Command for Input confirmation
Color Temperature			CTT	43 54 54	0 - 6	30 - 36	Command for Color Temperature confirmation
Color Temperature (User)			CTU	43 54 55	zyyyy z : 0 - 2 (0 : R, 1 : G, 2 : B) x : 0, 1 (0 : +, 1 : -) yyy : 0 - 200	z = 30 - 32 x = 30, 31 30 - 32 30 30	Command for Color Temperature (User) confirmation
Gamma Correction			GMT	47 4D 54	0 - 5	30 - 35	Command for Gamma Correction confirmation
Picture Mode	?	3F	PMD	50 4D 44	0 - 6	30 - 36	Command for Picture Mode confirmation
Contrast			CON	43 4F 4E	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Command for Contrast confirmation
Brightness			BRI	42 52 49	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Command for Brightness confirmation
Color			COL	43 4F 4C	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Command for Color confirmation
Tint			TIN	54 49 4E	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Command for Tint confirmation
Sharpness			SHP	53 48 50	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Command for Sharpness confirmation
Cinema Filter			CFT	43 46 54	0 : Movie, 1 : Brightness	30, 31	Command for Cinema Filter confirmation

[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
4D 3F 20 49 4E 50 20 0D	4D 21 20 41 43 4B 20 33 0D	Command operating the same as the MENU button
M? INP 	M! ACK 3 	Check result (VIDEO)

7) Menu setting commands (Not executable in stand-by mode.)

The menu setting commands are used for the menu setting of this projector. If the personal computer sends the command without attaching the data code, the projector attaches to the received command its current setting value as the data code and send it back to the PC.



	Action (ASCII)	Action (HEX)	Function (ASCII)	Function (HEX)	Data (Receive) (ASCII)	Data (Receive) (HEX)	Description
Lamp Mode	!	21	LPP	4C 50 50	0 : Normal, 1 : High	30, 31	Lamp Mode setting
Input			INP	49 4E 50	0 - 5	30 - 35	Input port (0 : HDMI, 1 : HDMI2, 2 : COMP, 3 : PC, 4 : Video, 5 : S-Video)
Color Temp			CTT	43 54 54	0 - 6	30 - 36	Color Temperature adjustment CT Table : (0 : 5800, 1 : 6000, 2 : 6500, 3 : 7500, 4 : 9300, 5 : High Bright, 6 : User)
Color Temp (User)			CTU	43 54 55	zxyyyy z : 0 - 2 (0 : R, 1 : G, 2 : B) x : 0, 1 (0 : +, 1 : -) yyyy : 0 - 200	z = 30 - 32 x = 30, 31 30 - 32 30 30	Color Temperature adjustment (User) Color : (0 : R, 1 : G, 2 : B) Value : 0 - 200
Gamma Correction			GMT	47 4D 54	0 - 5	30 - 35	Gamma adjustment Table : (0 : Cinema, 1 : 2.0, 2 : 2.1, 3 : 2.2, 4 : 3D, 5 : User)
Picture Mode			PMD	50 4D 44	0 - 6	30 - 36	Picture mode selection (0 : Cinema, 1 : VIDEO, 2 : 3D, 3 : Dynamic, 4 : User1, 5 : User2, 6 : User3)
Contrast			CON	43 4F 4E	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Contrast adjustment
Brightness			BRI	42 52 49	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Brightness adjustment
Color			COL	43 4F 4C	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Color adjustment
Tint			TIN	54 49 4E	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Tint adjustment
Sharpness			SHP	53 48 50	xyyy x : 0, 1 (0 : +, 1 : -) yyy : 0 - 50	x =30, 31 30 - 35 30	Sharpness adjustment
Cinema Filter			CFT	43 46 54	0 : Movie, 1 : Brightness	30, 31	Cinema Filter selection

How to set the value

Use the ASCII or HEX code as shown below to set the value.

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

[Example] When checking the Picture Mode setting (when the Picture Mode is set to Cinema).

Sending commands from the PC, etc.	Status code from the projector	Description
4D 3F 20 50 4D 44 20 0D	4D 21 20 41 43 4B 20 30 0D	Command operating the same as the MENU button
M? PMD 	M! ACK 0 	Check result (Cinema)