

LCD Projector
UL7400U

Controlling the projector via RS-232C connection

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1. Introduction

This projector is controllable by 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

[Compatibility with the former models]

To use the RS-232C commands designed for the former models of Mitsubishi projector, by inputting "00COMMAND0", the projector responds in the same way as the former models. (No NAK is returned. For NAK response, see page 4.)

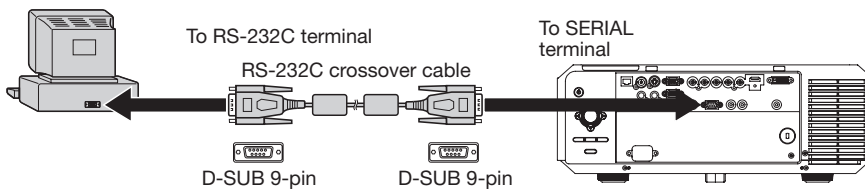
(For the recommended procedure to use the former command systems, see "Controlling the projector using a personal computer" for FL7000U.)

ITEM	Function		Data
	Character	ASCII code	
Changing the RS-232C command system	COMMAND	43h 4Fh 4Dh 4Dh 41h 4Eh 44h	0 (Former command system), 1 (New command system)

1.1 Connection

Important:

- Make sure to connect one computer to one projector.
- 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.



1.2 Interface

1.2.1 Pin assignment of SERIAL terminal (D-SUB 9-pin)

Pin No.	Name	I/O
1	OPEN	
2	RXD	IN
3	TXD	OUT
4	OPEN	
5	GND	
6	OPEN	
7	OPEN	
8	OPEN	
9	OPEN	

1.2.2 Communications format

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 supplied cable (crossover cable) should be used.

2. Control command configuration

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

	Address code	Function code	Data code	ACK/NAK	End code
ASCII code	'30h' '30h'	Function	Data	'3Ah' '4Eh'	'0Dh'
Character	00	Function	Data	:N	↵

[Address code] Fixed to 00. ('30h' '30h' in the ASCII code)

[Function code] Code unique to each control operation.

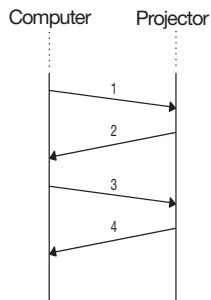
[Data code] Data (value) unique to each control operation (Not always indicated.)

[ACK/NAK] Code indicating the NAK return as described below

Fixed to :N ('3Ah' '4Eh' in the ASCII code. Not added to ACK.)

[End code] Fixed to ↵. ('0Dh' in the ASCII code)

3. Control sequence



	Sequence	Note
1	Send the command from the personal computer to the projector.	
2	After receiving the end code, the projector sends the return command.	If the projector does not receive commands normally, that is, if the projector is not connected physically or unable to receive commands, it does not send out a return command. When the received command cannot be executed, NAK is returned (as described below).
3	The personal computer checks the return command and confirms if the sent command has been received or not.	
4	Use the check command to see if the projector has executed the command.	This projector sends various codes including the return code. During the control sequence by RS-232C, reject other codes on the personal computer.

- NAK return
In the following cases, the projector returns the command with “:N” added.
 - (1) Though the command sent from the computer is received by the projector successfully, it cannot be executed because the projector is in the operation prohibition state.
 - (2) The data length of the sent command is incorrect or the command is invalid.
 - (3) The signal length of the command is 48 bytes or longer.
- When a command is sent out during the following operations, it may not be executed.
 - (1) During signal switching
 - (2) In the process of the auto position
 - (3) After the power is turned on.
After the power is turned on, no command is received until the image is displayed. (Usually, it takes about 20 seconds. However, when the lamp illumination takes time, more time will be required accordingly.) In this case, the projector returns the received command with NAK added.
- The return command is sent out within 1 second. In some cases, the response time takes longer (about 3 seconds).
- **When sending commands successively, wait to receive the return command of the current command before sending a next command.**
- The projector may not receive a command when the splash screen is being displayed immediately after turning on the power. Use command “00r10” to cancel the splash screen.
- While using the LAN terminals, the LAN functions take precedence.
- For the LAN terminals, the same commands as those for connecting with the TCP/IP (port number 63007) are available. Note, however, that the response becomes slightly slower than when using the RS-232C terminals. For the use of LAN terminals, refer to “4. Execution procedure of RS-232C commands via LAN”.
- When the NAK isn’t returned, check the RS-232C command system (00COMMAND).

[Example 1] Turning ON the power. (Values enclosed in quotation marks are ASCII codes.):

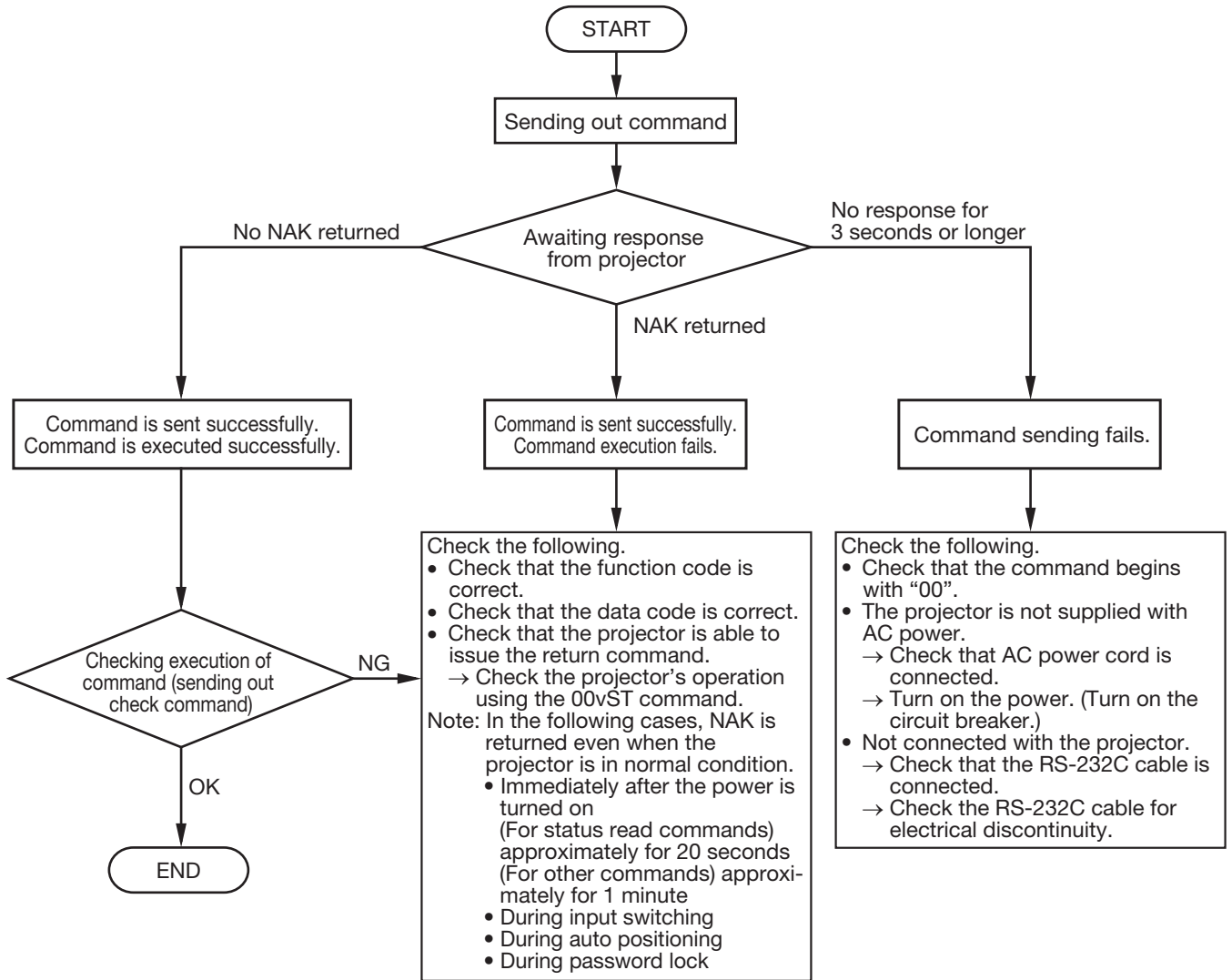
Command sent from the PC	Status code returned from the projector	Description
'30' '30' '21' '0D' 00! <input type="text"/>		Command for POWER ON
	'30' '30' '21' '0D' 00! <input type="text"/>	Command receipt confirmation (Command echo back)

[Example 2] Selecting VIDEO as the input signal during auto positioning (Values enclosed in quotation marks are ASCII codes.):

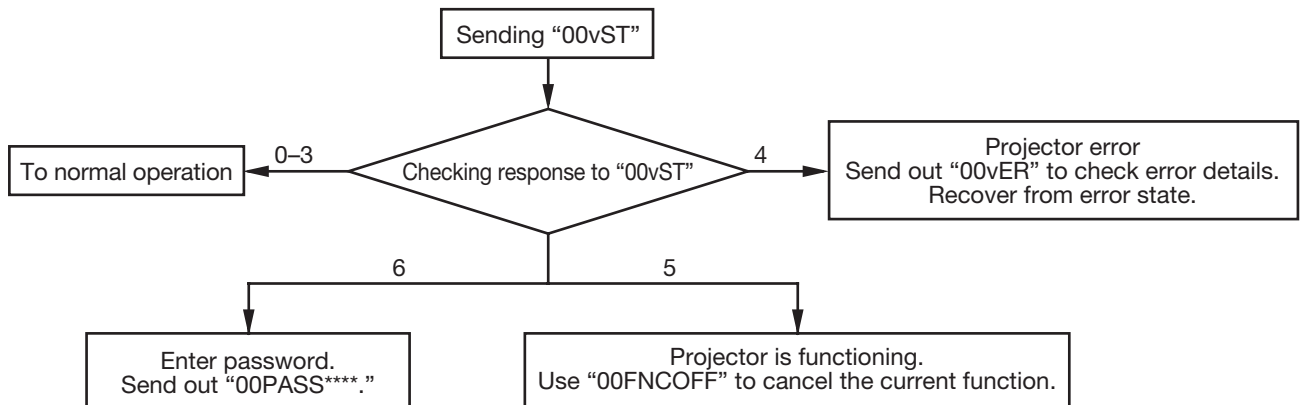
Command sent from the PC	Status code returned from the projector	Description
30' '30' '5F' '76' '31' '0D' 00_v1 <input type="text"/>		(During auto positioning) Command for selecting VIDEO as the input signal is sent out.
	'30' '30' '5F' '76' '31' '3A' '4E' '0D' 00_v1:N <input type="text"/>	The command is received by the projector but cannot be executed. (NAK return)

- The flowchart on the next page shows the recommended operating sequence for your reference to create a program.

[RS-232C control flowchart]



[Method of checking state of projector]



4. Execution procedure of RS-232C commands via LAN

- When you use the LAN function, set the STANDBY MODE to STANDARD or LAN.
- When you execute RS-232C commands via LAN, check that the CONTROL SYSTEM in the NETWORK menu is set to STANDARD.
- You can change the certification password using the NETWORK PASSWORD in the NETWORK menu. The default password is “admin.”
- You can skip the certification process by setting the NETWORK CERTIFICATION in the NETWORK menu to OFF. When you skip the certification process, Steps 2 to 4 described below can be skipped and you can send RS-232C commands without adding a certification data.

Example:

Sending the PON command (00!) while the NETWORK CERTIFICATION is set to OFF
00!↵

For the procedure to set the menu, refer to the User Manual supplied with the projector.

To execute the RS-232C command via LAN while the NETWORK CERTIFICATION is set to ON, a 32-byte connection certification data must be added before the RS-232C command.

To create a 32-byte certification data, following information and procedure are required.

- Random character string for creating the certification data that is acquired from the projector (8 characters)
- Network password of the projector (1 to 32 characters)
- MD5 hash calculation
- Based on the above, the execution procedures to connect to the projector and send the RS-232C commands while the NETWORK CERTIFICATION is set to ON are described below.
 1. Connect to Port 63007 of the projector from the PC as a TCP/IP client.
 2. After completing the connection, send the acquisition request for the certification data (“\$AK↵”) (ASCII code: 24 41 4B 0D) from the PC to the projector.
 3. Acquire “\$AK*****↵” on the PC as the response of the request sent in Step 2. (*****: Random character string for creating the certification data)
 4. Create the certification data on the PC.
 - Create the key of the certification data by linking the data acquired in Step 3 with the network character string.
 - For example, when the random character string is 12345678 and the password is ABCD, the key of the certification data is 12345678ABCD (character string in ASCII code).
 - Run MD5 hash on the key of the certification data.
 - Create the certification data by converting the hash-calculated 16-byte data into the ASCII code character string.

Example:

Calculation result: [4f][3c][5d][a1][7b][4f][b5][ed][2c][99][4e][bb][f6][57][67][54] (hexadecimal numeral)

Certification data: 4f 3c 5d a1 7b 4f b5 ed 2c 99 4e bb f6 57 67 54 (character string in ASCII code)

5. Send the RS-232C command with the certification data from the PC to the projector.

Example:

To send the PON command (00!↵) using the certification data created in Step 4:

4f3c5da17b4fb5ed2c994ebbf657675400!↵

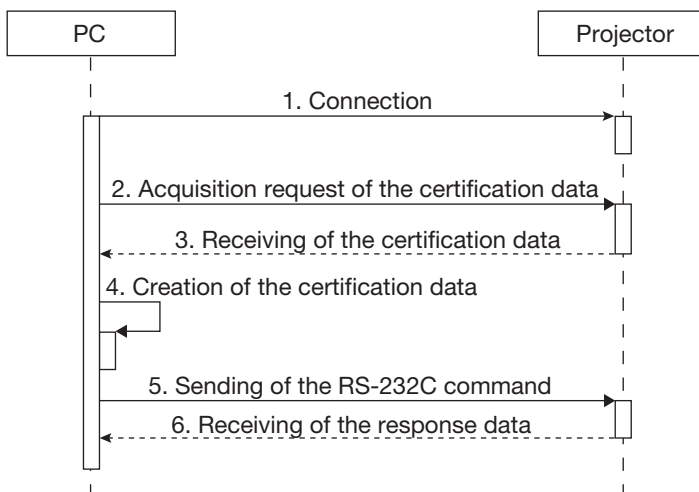
6. Receive the response from the projector on the PC.

Response data has the following patterns.

Normal: 00!↵ (Parameter is added depending on the command.)

Error in the certification data: PRV=ERRA↵

Command error: 00!:N↵



5. Command list

5.1 General control commands

The general control commands are used for the basic operation setting of this projector. They may not be executed while the signals are changed. The general control commands have no data codes. (When the commands for input select are sent while the splash screen is being displayed, the splash screen is only canceled.)

ITEM	Function		Note
	Character	ASCII code	
POWER ON	!	21h	This command is invalid for 150 seconds after the power is turned off.
POWER OFF	"	22h	This command is invalid for 1 minute after the power is turned on.
INPUT COMPUTER 1	_r1	5Fh 72h 31h	This command is not received during stand-by and BLANK.
INPUT COMPUTER 2	_r2	5Fh 72h 32h	This command is not received during stand-by and BLANK.
INPUT HDMI	_d1	5Fh 64h 31h	This command is not received during stand-by and BLANK.
INPUT DVI	_d2	5Fh 64h 32h	This command is not received during stand-by and BLANK.
INPUT VIDEO	_v1	5Fh 76h 31h	This command is not received during stand-by and BLANK.
INPUT S-VIDEO	_v2	5Fh 76h 32h	This command is not received during stand-by and BLANK.

[Example] When setting the input signal to COMPUTER 1. (Values enclosed in quotation marks are ASCII codes.):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '5F' '72' '31' '0D' 00_r1		Command for setting the input signal to COMPUTER 1
	'30' '30' '5F' '72' '31' '0D' 00_r1	Command receipt confirmation (Command echo back)

5.2 Reading commands

5.2.1 Status read commands

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

ITEM	Function		Data (Receive)		Status
	Character	ASCII	Character	ASCII	
POWER	vP	76h 50h	1	31h	POWER ON
			0	30h	POWER OFF
INPUT	vI	76h 49h	r1	72h 31h	INPUT COMPUTER 1
			r2	72h 32h	INPUT COMPUTER 2
			d1	64h 31h	INPUT HDMI
			d2	64h 32h	INPUT DVI
			v1	76h 31h	INPUT VIDEO
			v2	76h 32h	INPUT S-VIDEO
P-ON/OFF ENABLED/DISABLED	vPK	76h 50h 4Bh	0	30h	POWER ON/OFF DISABLED
			1	31h	POWER ON/OFF ENABLED
SIGNAL INPUT	vSM	76h 53h 4Dh	0	30h	NO SIGNAL SUPPLIED
			1	31h	SIGNAL SUPPLIED

5.2.2 Read commands for items in INFORMATION menu

Use the following commands to obtain the values of the items in the INFORMATION menu.

ITEM	Function		Data (Receive)
	Character	ASCII code	
LAMP TIME (LOW)	vLE	76h 4Ch 45h	hhhhmm
SERIAL NUMBER	vS/N	76h 53h 2Fh 4Eh	***** (within 7 characters)
RESOLUTION	vRESO	76h 52h 45h 53h 4Fh	HHHHxVVVV
VERTICAL FREQUENCY	vVFREQ	76h 56h 46h 52h 45h 51h	***.**
HORIZONTAL FREQUENCY	vHFREQ	76h 48h 46h 52h 45h 51h	***.**
SYNC. TYPE	vSYNCT	76h 53h 59h 4Eh 43h 54h	0 (NO SIGNAL), 1 (Invalid), 3 (3wire), 4 (4wire), 5 (5wire), 6 (SCART)

“hhhh” and “mm” represent hours and minutes respectively.

“HHHH” and “VVVV” represent the horizontal and vertical resolutions respectively.

“***.**” represents the vertical frequency (in Hz) or the horizontal frequency (in kHz).

5.2.3 Read commands for other information

Use the following commands to obtain other information.

ITEM	Function		Data (Receive)
	Character	ASCII code	
Model name	vMDL	76h 4Dh 44h 4Ch	***** (within 16 characters)
Input source	vSOUCE	76h 53h 4Fh 55h 43h 45h	r1 r2 v1 v2 d1 d2
Number of remaining filters	vFLTS	76h 46h 4Ch 54h 53h	00 to 09
Reading of filter usage time	vFLTT	76h 46h 4Ch 54h 54h	0000 to 9999
Projector status	vST	76h 53h 54h	0 (Stand-by mode), 1 (Within 1 minute after POWER-ON (warm-up mode)), 2 (POWER-ON mode (including state of warning)), 3 (Cooling mode), 4 (Abnormal state (including shutdown due to an error)), 5 (State of functioning (menu display, dialog display, BLANK, SPLIT, FREEZE, etc.)), 6 (Awaiting password entry)
Error status	VER	76h 45h 52h	Reading of the error status data (3 digits, hexadecimal numbers, total 9 bits) (MSB) xb1, xb2... xb8, xb9, 0, 0, 0 (LSB) xb1(800): Fan error xb2(400): Lamp error (The lamp goes out or does not light.) xb3(200): Lamp warning 1 (The lamp life has expired.) xb4(100): Lamp warning 2 (The lamp life is expiring.) xb5(080): Temperature error xb6(040): The temperature warning is being indicated. xb7(020): Lamp cover open error xb8(010): Filter/filter cover open error xb9(008): States of other component abnormality When only one error occurs, value shown in parentheses is returned. When multiple errors occur at the same time, the bits of all the occurred error are set. Example) C00: When fan error and lamp error occur at the same time 180: When lamp warning 2 and temperature error occur at the same time

The PC sends the command without attaching the data code to it. On the other hand, the projector attaches to the received command its current operating status as the data code and send it back to the PC.

[Example] When checking the currently selected input terminal (when the INPUT VIDEO is being selected).
(Values enclosed in quotation marks are ASCII codes.):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '76' '49' '0D' 00vl ↵		Command for checking the input terminal
	'30' '30' '76' '49' '76' '31' '0D' 00vlv1 ↵	Check result (VIDEO)

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

The remote control key commands allow the computer to control the projector in the same way as by the remote control. (Some operations cannot be controlled.) The remote control key commands have no data codes.

Button's name on remote control	Function	
	Character	ASCII code
+/VOLUME	r06	72h 30h 36h
-/VOLUME	r07	72h 30h 37h
ZOOM/FOCUS	r0f	72h 30h 66h
LENS SHIFT	r47	72h 34h 37h
GEOMETRY	r43	72h 34h 33h
PinP/SPLIT (SPLIT only)	r04	72h 30h 34h
BLANK	ra6	72h 61h 36h
▲	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
CE	re7	72h 65h 37h
TEST PATTERN	r50	72h 35h 30h
SUPER RESOLUTION	r96	72h 39h 36h
1 (numeric keypad)	r49	72h 34h 39h
2 (numeric keypad)	r4a	72h 34h 61h
3 (numeric keypad)	r4b	72h 34h 62h
4 (numeric keypad)	r4c	72h 34h 63h
5 (numeric keypad)	r4d	72h 34h 64h
6 (numeric keypad)	r4e	72h 34h 65h
7 (numeric keypad)	r88	72h 38h 38h
8 (numeric keypad)	r58	72h 35h 38h
9 (numeric keypad)	r89	72h 38h 39h
0 (numeric keypad)	r48	72h 34h 38h

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

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '72' '35' '34' '0D' 00r54 [↵]		Command operating the same as the MENU button
	'30' '30' '72' '35' '34' '0D' 00r54 [↵]	Command receipt confirmation (Command echo back)

5.4 Direct commands (Not executable in stand-by mode. Possible only to read during BLANK.)

The direct commands are used to numerically adjust the geometrical correction and volume.

When the computer sends the command without adding the setting value, the projector returns the received command with the current setting value added as a data code.

ITEM	Function		Data
	Character	ASCII code	
KEystone (vertical)	KS	4Bh 53h	±40 With CURVED-adjustment : ±10
KEystone (horizontal)	KSH	4Bh 53h 48H	±25 With CURVED-adjustment : ±10
KEystone reset	KSRST	4Bh 53h 52h 53h 54h	
CORNERSTONE LOWER RIGHT (vertical)	CNLRV	43h 4Eh 4Ch 52h 56h	±99
CORNERSTONE LOWER RIGHT (horizontal)	CNLRH	43h 4Eh 4Ch 52h 48h	±99
CORNERSTONE LOWER LEFT (vertical)	CNLLV	43h 4Eh 4Ch 4Ch 56h	±99
CORNERSTONE LOWER LEFT (horizontal)	CNLLH	43h 4Eh 4Ch 4Ch 48h	±99
CORNERSTONE UPPER RIGHT (vertical)	CNURV	43h 4Eh 55h 52h 56h	±99
CORNERSTONE UPPER RIGHT (horizontal)	CNURH	43h 4Eh 55h 52h 48h	±99
CORNERSTONE UPPER LEFT (vertical)	CNULV	43h 4Eh 55h 4Ch 56h	±99
CORNERSTONE UPPER LEFT (horizontal)	CNULH	43h 4Eh 55h 4Ch 48h	±99
CORNERSTONE reset	CKSRST	43h 4Bh 53h 52h 53h 54h	
HORIZ. CURVED ARC	CVAH	43h 56h 41h 48h	±50 With KEystone-adjustment : ±15
VERT. CURVED ARC	CVAV	43h 56h 41h 56h	±50 With KEystone-adjustment : ±15
HORIZ. CURVED ORIGIN (vertical)	CVHOV	43h 56h 48h 4Fh 56h	±10
HORIZ. CURVED ORIGIN (horizontal)	CVHOH	43h 56h 48h 4Fh 48h	±10
VERT. CURVED ORIGIN (vertical)	CVVOV	43h 56h 56h 4Fh 56h	±10
VERT. CURVED ORIGIN (horizontal)	CVVOH	43h 56h 56h 4Fh 48h	±10
CURVED reset	CVRST	43h 56h 52h 53h 54h	
VOLUME	VL	56h 4Ch	00 to 31

How to set the value

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

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

5.5 Function commands (Not executable in stand-by mode. When these commands are sent while the splash screen is being displayed, the splash screen is canceled.)

ITEM	Function		Data
	Character	ASCII code	
BLANK	MUTE	4Dh 55h 54h 45h	0 (OFF), 1 (ON)
SPLIT	SPLT	53h 50h 4Ch 54h	0 (OFF), 1 (ON)
FREEZE	FRZ	46h 52h 5Ah	0 (OFF), 1 (ON)
Function canceling	FNCOFF	46h 4Eh 43h 4Fh 46h 46h	

5.6 Menu setting commands (Not executable in stand-by mode except some commands. Possible only to read during BLANK except some commands.)

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.

5.6.1 IMAGE menu

ITEM	Function		Data
	Character	ASCII code	
COLOR ENHANCER	CE	43h 45h	0 (AUTO), 1 (PRESENTATION), 2 (STANDARD), 3 (THEATER), 4 (sRGB), 5 (USER), 6 (CLEAR BASE), 7 (BLUE BASE)
COLOR ENHANCER-USER-GAMMA MODE	CEU1GS	43h 45h 55h 31h 47h 53h	0 (DYNAMIC), 1 (NATURAL), 2 (DETAIL)
SUPER RESOLUTION	DHD	44h 48h 44h	0 (OFF), 1 (ON)
SUPER RESOLUTION-LEVEL	DHDLV	44h 48h 44h 4Ch 56h	1 to 5
CONTRAST	PP	50h 50h	±30
BRIGHTNESS	QQ	51h 51h	±30
NCM (MODE)	CMT	43h 4Dh 54h	1 (VIDEO), 2 (COMPUTER), 3 (USER), 4 (OFF)
NCM (R,G,B)	MRGB	4Dh 52h 47h 42h	±30 ±30 ±30 (R+G+B)
NCM (Y,C,M)	MYCM	4Dh 59h 43h 4Dh	±30 ±30 ±30 (Y+C+M)
NCM (SATURATION)	MSAT	4Dh 53h 41h 54h	±05
NCM (RGB-TINT)	MT	4Dh 54h	±15
COLOR TEMP.	A	41h	1 (STANDARD), 2 (HIGH), 3 (LOW), 4 (USER)
COLOR TEMP.-USER-CONTRAST	P	50h	±30 ±30 ±30 (R, G, B)
COLOR TEMP.-USER-BRIGHTNESS	Q	51h	±30 ±30 ±30 (R, G, B)
COLOR	T	54h	±10
TINT	S	53h	±10
SHARPNESS	R	52h	±05
AUTO IRIS	IRIS	49h 52h 49h 53h	0 (OFF), 1 (ON)
NOISE REDUCTION	NR	4Eh 52h	0 (OFF), 1 (ON)
CTI	CTI	43h 54h 49h	0 (OFF), 1 (ON)
INPUT LEVEL	IPL	49h 50h 4Ch	±5, For DVI input: +0 (NORMAL), +1 (ENHANCED) For HDMI input: +0 (AUTO), +1 (NORMAL), +2 (ENHANCED)
CLOSED CAPTION	CC	43h 43h	0 (OFF), 1 (CC1), 2 (CC2)

5.6.2 INSTALLATION menu

ITEM	Function		Data
	Character	ASCII code	
LAMP MODE	LM	4Ch 4Dh	0 (STANDARD), 1 (LOW)
STANDBY MODE	STBY	53h 54h 42h 59h	0 (STANDARD), 1 (LOW), 2 (LAN)
AUTO POWER ON	APON	41h 50h 4Fh 4Eh	0 (OFF), 1 (ON)
AUTO POWER OFF	APOF	41h 50h 4Fh 46h	0 (OFF), 1 (5 min.), 2 (10 min.), 3 (15 min.), 4 (30 min.), 5 (60 min.), 6 (4 hours), 7 (8 hours)
SPLASH SCREEN	SS	53h 53h	0 (OFF), 1 (ON)
BACK COLOR	BB	42h 42h	0 (BLACK), 1 (BLUE), 2 (IMAGE)
IMAGE REVERSE	IR	49h 52h	0 (OFF), 1 (MIRROR), 2 (INVERT), 3 (MIRROR INVERT)
ZOOM/FOCUS LOCK	FZL	46h 5Ah 4Ch	0 (OFF), 1 (ON)
LENS SHIFT LOCK	LSL	4Ch 53h 4Ch	0 (OFF), 1 (ON)
LENS SHIFT RESET	LSRST	4Ch 53h 52h 53h 54h	
DVI LONG CABLE (MODE)	DVIC	44h 56h 49h 43h	0 (AUTO), 1 (MANUAL)
DVI LONG CABLE (LEVEL)	DVICLV	44h 56h 49h 43h 4Ch 56h	00 to 21

5.6.3 FEATURE menu

ITEM	Function		Data
	Character	ASCII code	
ASPECT	SC	53h 43h	0 (NORMAL), 1 (16:9), 2 (REAL), 3 (FULL)
ASPECT-16:9-MODE	SCM	53h 43h 4Dh	0 (ALL SIGNALS), 1 (VIDEO ONLY)
SCREEN	SCR	53h 43h 52h	0 (16:10), 1 (16:9)
PROJECTOR ID	PID	50h 49h 44h	00 (ALL), 01 to 63
PASSWORD FUNCTION	PSLOCK	50h 53h 4Ch 4Fh 43h 4Bh	0**** (UNLOCK), 1**** (DISPLAY INPUT), 2**** (MENU ACCESS), 3**** (SPLASH ID SCREEN) **** is a 4 to 8-digit password comprised of any figures 1 to 4.
MENU POSITION	MP	4Dh 50h	0 (Upper left), 1 (Lower right), 4 (Center)
CINEMA MODE	CINE	43h 49h 4Eh 45h	0 (VIDEO), 1 (AUTO), 2 (FILM)
FILTER MENU -AUTO ROLL UP PERIOD	FLCP	46h 4Ch 43h 50h	0 (OFF), 1 (Every 500 hours), 2 (Every 750 hours), 3 (Every 1000 hours)
FILTER MENU -MANUAL ROLL UP	FLMC	46h 4Ch 4Dh 43h	
FILTER MENU -REMAINING FILTERS	vFLTS	46h 4Ch 54h 53h	00 to 09 (number of times)
FILTER MENU -FILTER USAGE TIME	vFLT	46h 4Ch 54h 54h	0000 to 9999 (hours)
FILTER MENU -FILTER RESET	TRSTFL	54h 52h 53h 54h 46h 4Ch	Reset of the number of remaining filters and filter usage time
LANGUAGE	LG	4Ch 47h	00 (日本語), 01 (English), 02 (Español), 03 (Deutsch), 04 (Français), 05 (Italiano), 06 (中文), 07 (한국어), 08 (РУССКИЙ), 09 (PORTUGUÊS), 11 (SVENSKA), 12 (POLSKI), 16 (Nederlands), 17 (Norsk), 18 (اللغة العربية), 19 (Türkçe), 20 (ภาษาไทย), 21 (Bahasa Indonesia), 22 (Melayu), 23 (Tiếng Việt)
HIGH ALTITUDE MODE	ALTI	41h 4Ch 54h 49h	0 (STANDARD), 1 (HIGH ALTITUDE)
VIDEO SIGNAL (VIDEO only)	VS	56h 53h	0 (AUTO), 1 (NTSC), 2 (PAL), 3 (SECAM), 4 (4.43NTSC), 5 (PAL-M), 6 (PAL-N), 7 (PAL-60)
SET UP	STU	53h 54h 55h	0 (AUTO), 1 (OFF), 2 (3.75%), 3 (7.5%)
SCART INPUT	SRT	53h 52h 54h	0 (OFF), 1 (ON)
LAMP WARNING	LW	4Ch 57h	0 (STANDARD), 1 (SHORT TERM)
HIDE OSD	HOSD	48h 4Fh 53h 44h	0 (OFF), 1 (ON)
RESET ALL	RSTALL	52h 53h 54h 41h 4Ch 4Ch	

5.6.4 SIGNAL menu

ITEM	Function		Data
	Character	ASCII code	
MEMORY CALL	MMC	4Dh 4Dh 43h	0 (AUTO), 1 (MEMORY1), 2 (MEMORY2)
HORIZ.POSITION	HP	48h 50h	+ (increment), - (decrement) ^{*1}
VERT. POSITION	VP	56h 50h	+ (increment), - (decrement) ^{*1}
FINE SYNC.	FN	46h 4Eh	00 to 31
TRACKING	TRK	54h 52h 4Bh	+ (increment), - (decrement) ^{*1}
COMPUTER INPUT	CIN	43h 49h 4Eh	0 (RGB), 1 (YCbCr/YPbPr), 2 (AUTO)
OVER SCAN	VOS	56h 4Fh 53h	00 (90%) to 10 (100%)
HOLD	HLD	48h 4Ch 44h	0 (OFF), 1 (ON)
HOLD BEGIN	HLB	48h 4Ch 42h	00–99
HOLD END	HLE	48h 4Ch 45h	00–99
CLAMP POSITION	CLP	43h 4Ch 50h	001–255
CLAMP WIDTH	CLW	43h 4Ch 57h	01–63
VERT. SYNC.	VSC	56h 53h 43h	0 (AUTO), 1 (OFF)
LPF	LPF	4Ch 50h 46h	0 (OFF), 1 (ON)
SHUTTER(U)	SHU	53h 48h 55h	00 to 38
SHUTTER(L)	SHL	53h 48h 4Ch	00 to 38
SHUTTER(LS)	SHLS	53h 48h 4Ch 53h	00 to 63
SHUTTER(RS)	SHRS	53h 48h 52h 53h	00 to 63

*1) Setting range differs depending on the input signals.

5.6.5 NETWORK menu

ITEM	Function		Data
	Character	ASCII code	
PROJECTOR NAME	NAME	4Eh 41h 4Dh 45h	Up to 15 single-byte alphanumeric characters
NETWORK RESTART	NRCN	4Eh 52h 43h 4Eh	

- Some commands are not executed depending on the input signal. The operational restrictions same as those on the menu setting are applied. Refer to “Menu operation” in the User Manual for more details.

How to set the value

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

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

[Example 1] When setting the AUTO POWER ON to ON. (Values enclosed in quotation marks are ASCII codes.):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '41' '50' '4F' '4E' '31' '0D' 00APON1		Command for setting the AUTO POWER ON to ON
	'30' '30' '41' '50' '4F' '4E' '31' '0D' 00APON1	Command receipt confirmation (Command echo back)

[Example 2] When setting the CONTRAST R of the COLOR TEMP.-USER to +10, the CONTRAST G to 0, and the CONTRAST B to -5. (Values enclosed in quotation marks are ASCII codes.):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '50' '2B' '31' '30' '2B' '30' '30' '2D' '30' '35' '0D' 00P+10+00-05		Command for setting the picture control
	'30' '30' '50' '2B' '31' '30' '2B' '30' '30' '2D' '30' '35' '0D' 00P+10+00-05	Command receipt confirmation (Command echo back)

[Example 3] When checking the TINT setting (when the TINT is set to +10). (Values enclosed in quotation marks are ASCII codes.):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '53' '0D' 00S		Command for checking the TINT setting
	'30' '30' '53' '2B' '31' '30' '0D' 00S+10	Check result (+10)

[Example 4] When setting the GAMMA MODE of the COLOR ENHANCER-USER to DETAIL. (Values enclosed in quotation marks are ASCII codes.):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '43' '45' '55' '31' '47' '53' '32' '0D' 00CEU1GS2		Command for setting the picture control
	'30' '30' '43' '45' '55' '31' '47' '53' '32' '0D' 00CEU1GS2	Command receipt confirmation (Command echo back)



5.7 Password lock commands

The password lock commands control the password lock. The password lock enabling or disabling command is sent with a 4 to 8-digit password comprised of any figures 1 to 4 added to the end of the data code. When the password lock is enabled or disabled successfully, the projector sends a return command comprising the data code, password, and “1” at the end. When enabling or disabling the password lock fails, it sends a return command with “0” at the end. There is no reconfirmation of the password. The password input command is for enabling projection of image when password lock has been set to DISPLAY INPUT. The password input command is sent with a 4 to 8-digit password comprised of any figures 1 to 4 at the end.

ITEM	Function		Data
	Character	ASCII code	
Password lock enabling/ disabling	PSLOCK	50h 53h 4Ch 4Fh 43h 4Bh	0**** (Disabling), 1**** (DISPLAY INPUT), 2**** (MENU ACCESS), 3**** (SPLASH ID SCREEN)
Password input	PASS	50h 41h 53h 53h	****

**** is a 4 to 8-digit password comprised of any figures 1 to 4.

[Example] When enabling the password lock of DISPLAY INPUT (in the case that the password is 123412).
(Values enclosed in quotation marks are ASCII codes.):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '50' '53' '4C' '4F' '43' '4B' '31' '31' '32' '33' '34' '31' '32' '0D' 00PSLOCK1123412 		Command for enabling the password lock of DISPLAY INPUT
	'30' '30' '50' '53' '4C' '4F' '43' '4B' '31' '31' '32' '33' '34' '31' '32' '31' '0D' 00PSLOCK11234121 	Response informing that the projector succeeded in enabling the password lock of DISPLAY INPUT