ESC/VP

(EPSON Standard Code for Video Projectors)

Level 3

Reference Manual

for

EMP/ELP-3500

EMP/ELP-5000/ 5100

EMP-7000/ 7100

November 28, 1996

V Design 2G

SEIKO EPSON

Contents

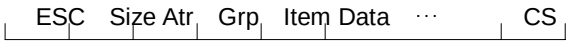
1. Command Outline

1.1 Command Structure

All commands for the ESC/VP starts with the ESC(1Bh).

The command's structure is shown below.

ESC [Size] [Attribute] [Classification] [Function] [Data] [CS]



(Byte Number)	1	1	1	1	1	n	1

Size

It shows command size.

(Specify number of data from ESC to CS to command size.)

Attribute

It shows attributes and its code.

(Attribute)	(Code)		
Set	0 x o 1	:	Sets values.
Get	0 x 0 2	:	Gets values presently set.
Initialize	0 x 0 3	:	Returns values to defaults.
Response	0 x 0 4	:	Sends responses to the setting from PC.(Only FROM Group)

Classification

Functional classification for the ESC/VP and their codes are as shown below.

Functional Classification	Code
Special Control	0x00
Screen Control (Sceen)	0x01
Audio Control (Audio)	0x02
PC Control (PC)	0x03
VIDEO Control (Video)	0x04
Display Control (Diplay)	0x05
Option (Option)	0x06
Custom (Custom)	0x07
H/W Control	0x08
Flush ROM	0x09
For system Reserved	0x0E
For system Reserved	0x0F

Function

Function of the ESC/VP and their codes are as follows.

Operation Mode : All operation modes [A]
Regular modes and Application modes [B]
Circuit adjustment modes [C]
Download and Upload modes [D]

Type of Machines : EMP/ELP-3500, 5000, 5100, 7000 and 7100 [B]
EMP/ELP-3500 [D]
WMP-5000, 5100, 7000 and 7100 [C]

Classification	Code	Function	Function Code	Operation Mode	Type of Machines
Special Control	0x00	Operation Mode	0x00	[A]	[B]
		Menu Mode	0x01	[B]	[B]
		Reset	0x02	[B]	[B]
		Power	0x03	[B]	[B]
		Product ID	0x04	[B]	[B]
		Software Version	0x05	[B]	[B]
		Communication Rate	0x06	[B]	[C]
		Initialize all function	0x07	[B]	[B]
		Mouse/Serial	0x08	[B]	[C]
		Lamp Life	0x09	[B]	[C]
		Key Operation	0x0A	[B]	[C]
		Get Action of Application	0x0B	[B]	[C]
Screen Control (Screen)	0x01	Input Source	0x00	[B]	[B]
		Input Mode	0x01	[B]	[B]
		Freeze	0x02	[B]	[C]
		Pause	0x03	[B]	[D]
Audio Control (Audio)	0x02	Volume	0x00	[B]	[B]
		Tone	0x01	[B]	[C]
		Loudness	0x02	[B]	[C]
		Mute	0x03	[B]	[B]
		Specializer	0x04	[B]	[C]
PC Control(PC)	0x03	Brightness	0x00	[B]	[B]
		Contrast	0x01	[B]	[B]
		Sync	0x02	[B]	[B]
		Tracking	0x03	[B]	[B]
		Tracking base	0x04	[B]	[B]
		Mouse/Serial Port fixed	0x05	[B]	[C]
		Red Level	0x06	[B]	[B]
		Green Level	0x07	[B]	[B]
		Blue Level	0x08	[B]	[B]

VIDEO Control (Video)	0x04	Brightness	0x00	[B]	[B]
		Contrast	0x01	[B]	[B]
		Sharpness	0x02	[B]	[B]
		Saturation	0x03	[B]	[B]
		Tint	0x04	[B]	[B]
		Video Mode	0x05	[B]	[B]
Display Control (Display)	0x05	Horizontal position	0x00	[B]	[B]
		Vertical position	0x01	[B]	[B]
		Rear Proj	0x02	[B]	[B]
		Upside Down	0x03	[B]	[C]
		Color Temp	0x04	[B]	[C]
		Color Temp of Red Level	0x05	[B]	[C]
		Color Temp of Green L	0x06	[B]	[C]
		Color Temp of Blue L	0x07	[B]	[C]
Option(Option)	0x06	Display Language	0x00	[B]	[B]
		Power Save	0x01	[B]	[D]
		Source Prompt	0x03	[B]	[B]
		Colors for Blank	0x04	[B]	[C]
		Colors for non-display area	0x05	[B]	[C]
		Number of Gamma Table	0x06	[B]	[D]
		Change Screen	0x07	[B]	[C]
		User Gamma Setting	0x08	[B]	[C]
Custom(Custom)	0x07	Effect	0x00	[B]	[B]
		Custom	0x01	[B]	[C]
		Counts of Frames	0x02	[B]	[C]
		Counts of Time	0x03	[B]	[C]
H/W Control	0x08	1 2 C	0x00	[C]	[B]
		Memory	0x01	[C]	[B]
		V S 2200	0x02	[C]	[C]
		Gamma Data	0x03	[C]	[C]
		CPU A/D Resister	0x04	[C]	[B]
		Key Codes	0x05	[C]	[B]
		FROM Checksum	0x06	[C]	[B]
		Mouse Movement	0x07	[C]	[B]
		OSD Parameter	0x08	[C]	[B]
		Reserved	0x09		
		Reserved	0x0A		
		OSD Character Data	0x0B	[C]	[B]
		No Gamma	0x0C	[C]	[B]
		Lamp ON/OFF	0x0D	[C]	[B]
		Get frame memory	0x0E	[C]	[C]
Flash ROM	0x09	Delete area	0x00	[D]	[B]
		Upload area、Size	0x01	[D]	[B]
		FROM Data	0x02	[D]	[C]

CS (Checksum)

Shows the checksum from size to data.

Correct number of 2 added byte data is taken fro checksum.

Possible Range to Set

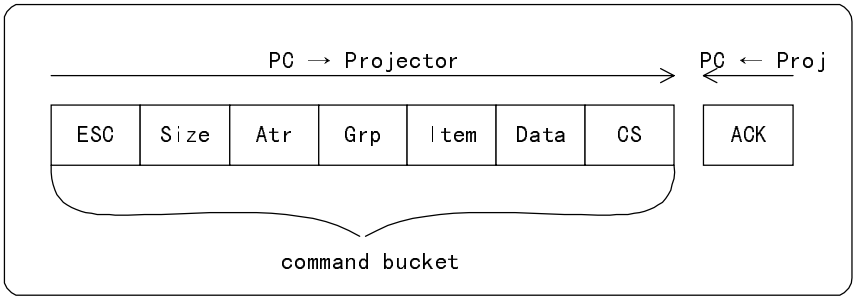
Classification	Code	Function	Code	EMP/ELP-3500		EMP/ELP-5000, 5100, 7000, 7100	
				Min.	Max.	Min.	Max.
Special Control	0x00	Operation Mode	0x00	---	---	---	---
		Menu Mode	0x01	00	01	00	01
		Reset	0x02	---	---	---	---
		Power	0x03	00	01	00	01
		Product ID	0x04	---	---	---	---
		Software Version	0x05	---	---	---	---
		Communication Rate	0x06	00	02	00	02
		Initialize all function	0x07	---	---	---	---
		Mouse/Serial	0x08	00	01	00	01
		Lamp Life	0x09	---	---	---	---
		Key Operation	0x0A	---	---	---	---
		Get Action of Application	0x0B	---	---	---	---
Screen Control (Screen)	0x01	Input Source	0x00	---	---	---	---
		Input Mode	0x01	---	---	---	---
		Freeze	0x02	00	01	00	01
		Pause	0x03	00	01	00	01
Audio Control(Audio)	0x02	Volume	0x00	00	17	00	21
		Tone	0x01	F8	8	F8	8
		Loudness	0x02	00	01	00	01
		Mute	0x03	00	01	00	01
		Specializer	0x04	00	02	00	02
PC Control(PC)	0x03	Brightness	0x00	F5	0C	E2	1E
		Contrast	0x01	F5	0C	E2	1E
		Sync	0x02	00	1F	00	1F
		Tracking	0x03	80	7F	80	7F
		Tracking base	0x04	---	---	---	---
		Mouse/Serial Port fixed	0x05	00	02	00	02
		Red Level	0x06	80	7F	E0	20
		Green Level	0x07	80	7F	80	7F
		Blue Level	0x08	80	7F	80	7F
VIDEO Control (Video)	0x04	Brightness	0x00	F5	0C	F4	0C
		Contrast	0x01	F5	0C	F5	0C
		Sharpness	0x02	0	6	0	6
		Saturation	0x03	F5	0C	F5	0C
		Tint	0x04	F5	0C	F5	0C
		Video Mode	0x05	00	03	00	03
Display Control (Display)	0x05	Horizontal Position	0x00	C1	3F	C1	3F
		Vertical Position	0x01	80	7F	80	7F
		Rear Proj	0x02	00	01	00	01
		Upside Down	0x03	00	01	00	01
		Color Temp	0x04	00	03	00	03
		Color Temp of Red Level	0x05	80	7F	80	7F
		Color Temp of Green	0x06	80	7F	80	7F
		Color Temp of Blue	0x07	80	7F	80	7F

Option(Option)	0x06	Display Language	0x00	00	05	00	06
		Power Save	0x01	00	3C	00	3C
		Source Prompt	0x03	00	01	00	01
		Colors for Blank	0x04	00	01	00	01
		Colors for non-display area	0x05	00	00	00	00
		Number of Gamma Table	0x06	00	01	00	01
		Change Screen	0x07	00	03	00	03
		User Gamma Setting	0x08	---	---	---	---
Custom(Custom)	0x07	Effect	0x00	01	05	01	05
		Custom	0x01	---	---	00	02
		Counts of Frames	0x02	00	02	00	02
		Counts of Time	0x03	0	9	0	9
H/W Control	0x08	1 2 C	0x00	---	---	---	---
		Memory	0x01	---	---	---	---
		V S 2000	0x02	---	---	---	---
		Gamma Data	0x03	---	---	---	---
		CPU A/D Resister	0x04	---	---	---	---
		Key Code	0x05	---	---	---	---
		FROM Checksum	0x06	---	---	---	---
		Mouse Movement	0x07	00	01	00	01
		OSD Parameter	0x08	---	---	---	---
		Reserved	0x09	---	---	---	---
		Reserved	0x0A	---	---	---	---
		OSD Character Data	0x0B	---	---	---	---
		No Gamma	0x0C	00	00	00	01
		Lamp ON/OFF	0x0D	00	01	00	01
		Get frame memory	0x0E	---	---	---	---
Flash ROM	0x09	Delete area	0x00	---	---	---	---
		Upload are、Size	0x01	---	---	---	---
		FROM Data	0x02	---	---	---	---

1.2 Transfer Process

When the projector receives commands and parameters from the computer, it checks their contents and returns response codes whether received data correctly or not to the computer.

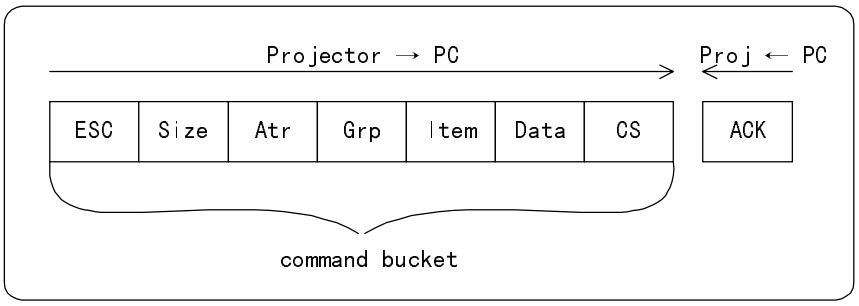
The transfer process for one command is completed when the computer verifies the response code. Projector once returns a response command to one command packet.



(EMP/ELP-3500)

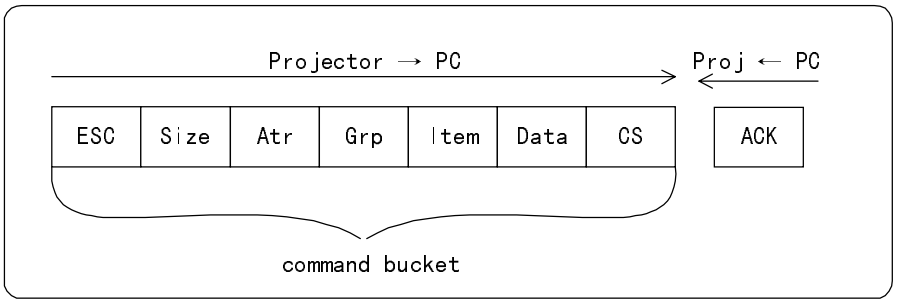
When the computer receives data from the projector, it checks its contents and returns response codes whether received data correctly or not to the projector.

The transfer process for one command is completed when the projector verifies the response code. Computer once returns a response command to one command packet.



(EMP/ELP-5000, 5100, 7000, 7100)

Computer receives data from the projector.



2. Transfer Mode

2.1 Function for Transfer Mode

EPSON Projector has five operation modes. Allows to change modes freely by issuing Transfer Mode Commands. However, user shall not issue the commands to download data to FROM , upload data from FROM and transfer to Adjustment Mode because they fails to operate the program and data inside of the projector. Each mode is described below.

Regular Mode

Regular mode when turning on the projector. In this mode, it allows you to input codes for remote control, keypad and control. Projector doesn't control when sending the H/W control-command for Control Code and the control command for Flash ROM to the projector. Also, effect key commands for Custom are not issued from the projector in this mode.

Application Mode

Application Mode allows you to control the projector with application. In this mode, you may input codes for remote control, keypad and control. Projector doesn't control when sending the H/W control command for Control Code and the control command for Flash ROM to the projector.

Circuit Adjustment Mode

Circuit Adjustment Mode is to change setting values for projector. If you change to this mode, you may not input the control codes for remote control and keypad. Only H/W control command and transfer command of projector mode are available. Also, effect key commands for Custom are not issued from the projector in this mode.

Download Mode

Download Mode is to rewrite the data within Flash ROM contained in the projector. If you change to this mode, you may not input the control codes for remote control and keypad. Only control command for Flash ROM and transfer command of projector mode are available. Also, effect key commands for Custom are not issued from the projector in this mode.

Upload Mode

Upload Mode is to read out the data within Flash ROM contained in the projector. If you change to this mode, you may not input the control codes for remote control and keypad. Only control command for Flash ROM and transfer command of projector mode are available. Also, effect key commands for Custom are not issued from the projector in this mode.

3. Control Code

ESC/VP defines the code system to control all function for the projector.

3.1 Special Control

Allows to change operation modes and reset. Each function for the special control are as follows.

Operation Mode(Group : 0 Item : 0)

Operation Mode Setting

[Function] Sets operation modes for the projector.

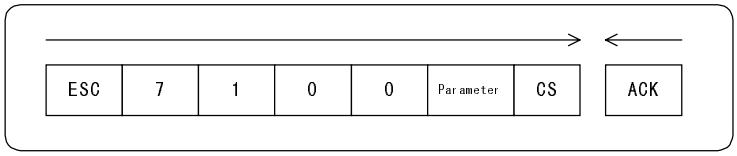
[Form] <hexadecimal> 1B 07 01 00 00 Parameter CS

[Parameter]

This parameter specifies the data for each operation modes.

Possible Data for Setting :

Regular Mode	:	00
Application Mode	:	01
Download Mode	:	02
Upload Mode	:	03
Circuit Adjustment Mode	:	04



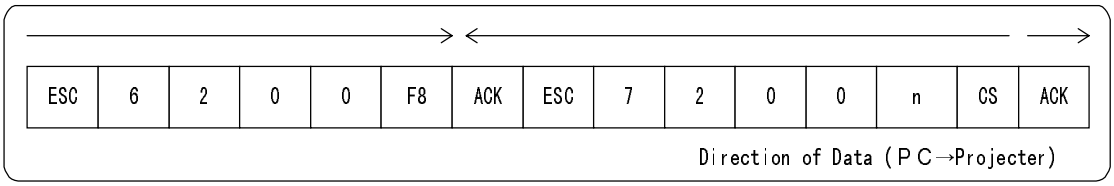
Get Operation Mode

[Function] Gets the present operation mode of the projector.

[Form] <hexadecimal> 1B 06 02 00 00 FS

[Return Value]

Returns the present operation mode of the projector.



However, the get operation mode is available only in regular mode and upload mode.

In other modes, it doesn't return any operation mode.

Menu Mode(Group : 0 Item : 1)

Menu Mode Setting

[Function] Sets menu mode for the projector.

[Form] <hexadecimal> 1B 07 01 00 01 Parameter CS

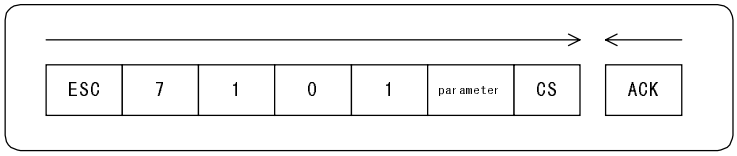
[Parameter]

This parameter specifies the data for Menu ON and OFF.

Possible Data for Setting :

Display Mode : 00

Menu Mode : 01



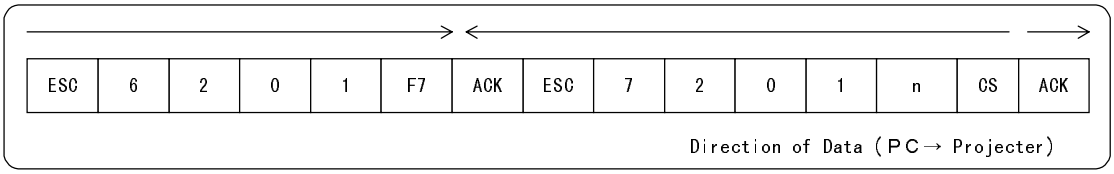
Get Menu Mode

[Function] Gets the present menu state.

[Form] <hexadecimal> 1B 06 02 00 01 F7

[Return Value]

Returns the present menu state.

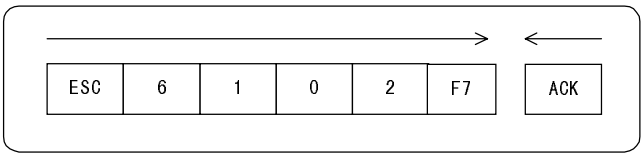


Reset (Group : 0 Item : 2)

Reset Setting

[Function] Issues reset commands to the projector.

[Form] <hexadecimal> 1B 06 01 00 02 F7



Power (Group : 0 Item : 3)

Power ON/OFF Setting

[Function] Turns on or off the projector.

[Form] <hexadecimal> 1B 07 01 00 03 Parameter CS

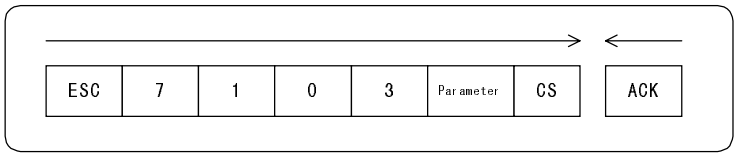
[Parameter]

This parameter specifies the data for Power ON/OFF.

Possible Data for Setting :

OFF : 00

ON : 01



Get Power State

[Function] Gets the present power state of the projector.

[Form] <hexadecimal> 1B 06 02 00 03 F5

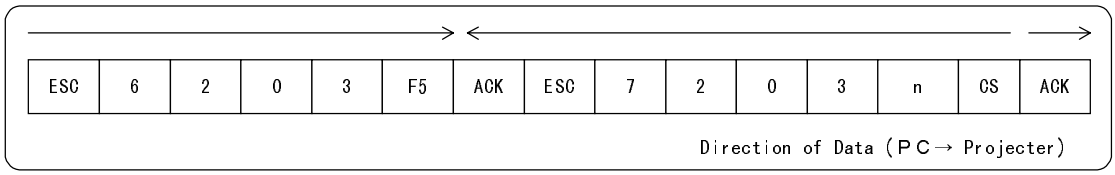
[Return Value]

Returns the present power state of the projector.

Power OFF : 00

Power ON : 01

Under processing : 10



Product ID(Group : 0 Item : 4)

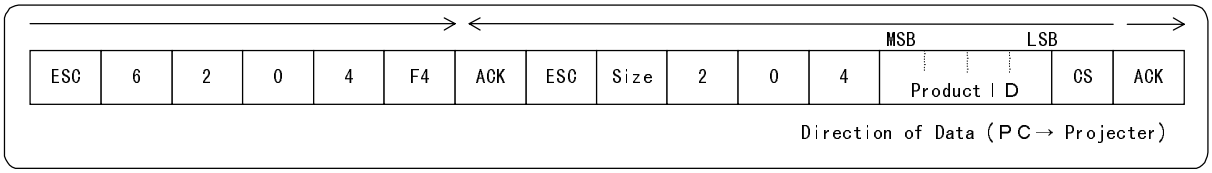
Get Product ID

[Function] Gets product ID.

[Form] <hexadecimal> 1B 06 02 00 04 F4

[Return Value]

Returns product ID.



Product ID :

EMP/ELP-3500	:	“ RS-353”	{ 0x52,0x53,0x2D,0x33,0x35,0x33} 6 bite
EMP/ELP-5000, 5100	:	“ RS-361”	{ 0x52,0x53,0x2D,0x33,0x36,0x31} 6 bite
EMP/ELP-7000, 7100	:	“ RS-376”	{ 0x52,0x53,0x2D,0x33,0x37,0x36} 6 bite

Software Version(Group : 0 Item : 5)

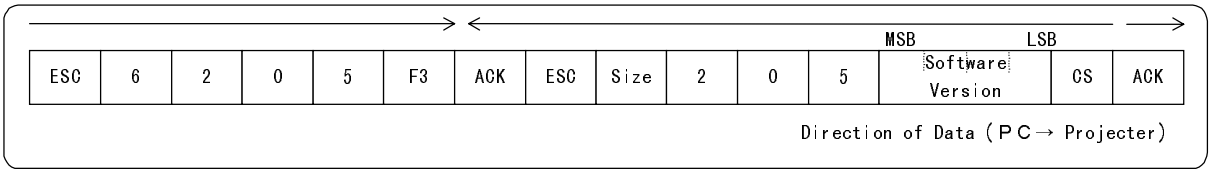
Get Software Version

[Function] Gets software version.

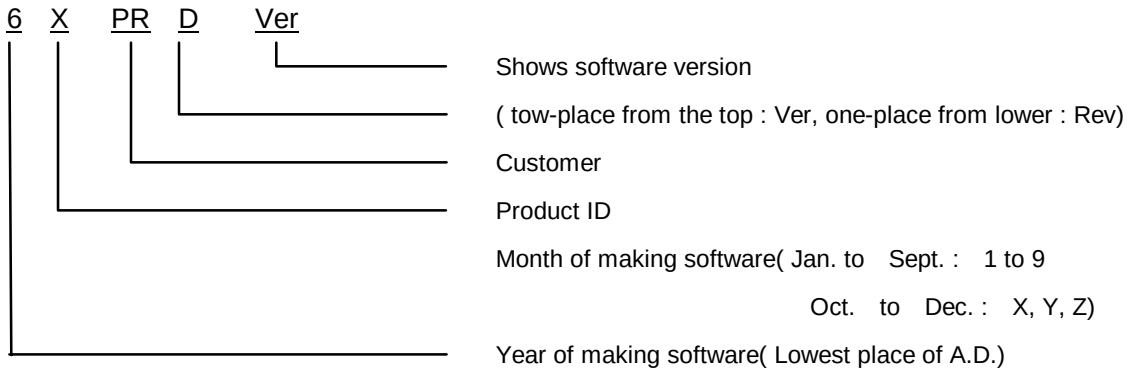
[Form] <hexadecimal> 1B 06 02 00 05 F3

[Return Value]

Returns software version.



Version Rules



Communication Rate(Group : 0 Item : 6)

Communication Rate Setting

[Function] Sets the communication rate for Serial.

[Form] <hexadecimal> 1B 07 01 00 06 Parameter CS

[Parameter]

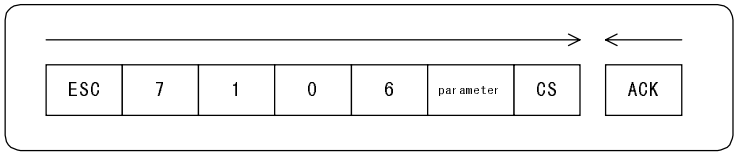
This parameter specifies the data for communication rate.

Possible Data for Setting :

9600 bps : 00

19200 bps : 01

38400 bps : 02



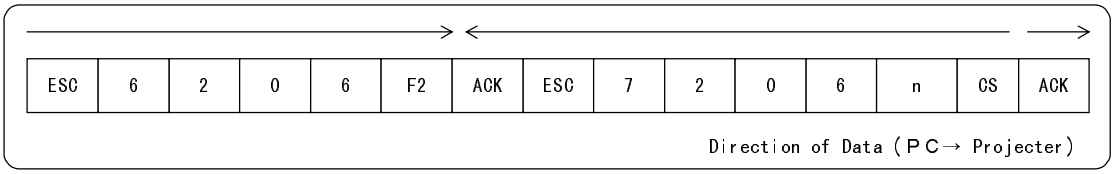
Get Communication Rate

[Function] Gets the present communication rate.

[Form] <hexadecimal> 1B 06 02 00 06 F2

[Return Value]

Returns the present communication rate.



Initialize Communication Rate

[Function] Initializes communication rate.

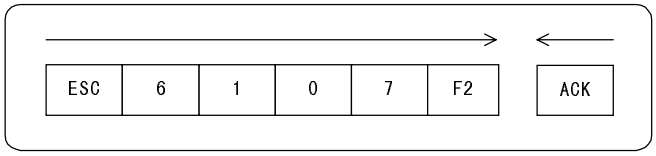
[Form] <hexadecimal> 1B 06 03 00 06 F1

Initialize All Function(Group : 0 Item : 7)

Initialize All Function

[Function] Initializes all function.

[Form] <hexadecimal> 1B 06 01 00 07 F2



Mouse/Serial Port(Group : 0 Item : 8)

Mouse/Serial Port

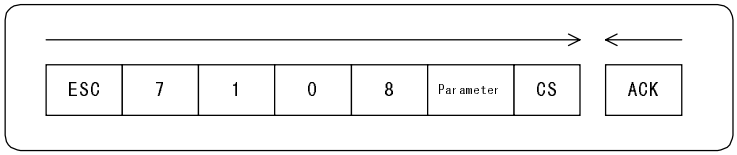
[Function] Use for sending response commands to the command which changes between mouse and serial port sending from the projector.

[Form] <hexadecimal> 1B 07 01 00 08 Parameter CS

[Parameter]

Invalid mouse/serial port : 00

Valid mouse/serial port : 01



Lamp Life(Group : 0 Item : 9)

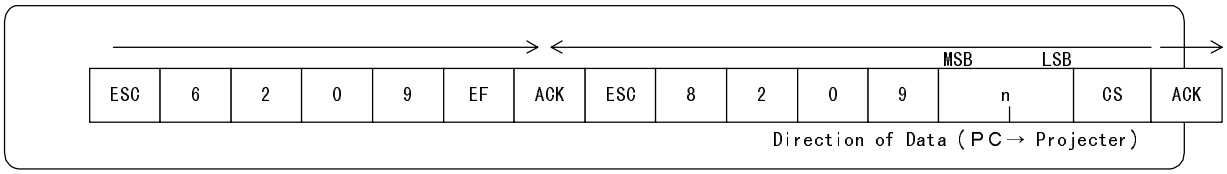
Get Lamp Life

[Function] Gets the present lamp life.

[Form] <hexadecimal> 1B 06 02 00 09 EF

[Return Value]

Returns the present lamp life(time).



Key Operation(Group : 0 Item : A)

Key Operation Setting

[Function] Sets the key codes assigned on buttons and performs the assigned function.

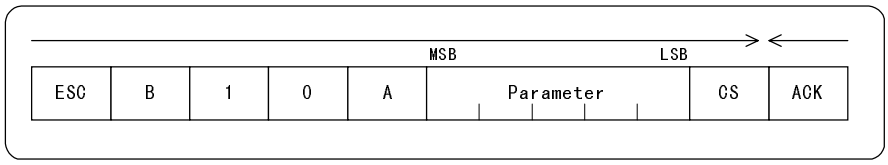
[Form] <hexadecimal> 1B 0B 01 00 0A Parameter CS

[Parameter]

This parameter specifies the key codes assigned on buttons.

Key Code : (5 byte)

Standby	:	000000001	Sync+	:	0000008000
Computer	:	0000000002	Sync-	:	0000010000
Video	:	0000000004	Tracking+	:	0000020000
Resize	:	0000000008	Tracking-	:	0000040000
Freeze	:	0000000010	Menu	:	0000080000
Blank	:	0000000020	Select+ (Not work)	:	0000100000
Auto	:	0000000040	Select- (Not work)	:	0000200000
Mute	:	0000000080	Adjust+ (Not work)	:	0000400000
Enter	:	0000000100	Adjust- (Not work)	:	0000800000
Power	:	0000000200	Up	:	0001000000
Source (only LCP)	:	0000000400	Down	:	0002000000
Pause (only LCP)	:	0000000800	Left	:	0004000000
User (only LCP)	:	0000001000	Right	:	0008000000
Volume+	:	0000002000	Mouse Left Button	:	0010000000
Volume-	:	0000004000	Mouse Right Button	:	0020000000
			Custom	:	0040000000
			Brightness+	:	0080000000
			Brightness-	:	0100000000
			Contrast+	:	0200000000
			Contrast-	:	0400000000



Get Application State(Group : 0 Item : B)

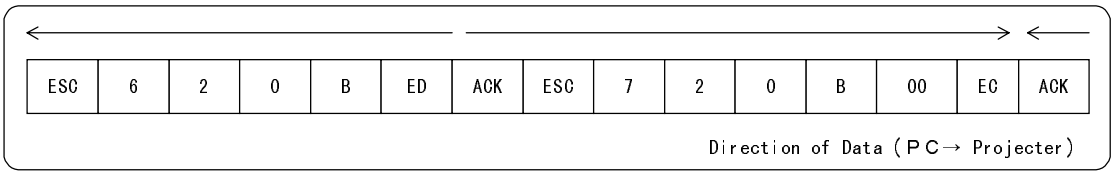
Operating State of Application

[Function] Inquires that now application has been working or not. Projector issues this command to the application. After the application received the command, returns a response packet to the projector. If the projector failed to receive the response packet, the projector interprets that the application was aborted or problems occurred on the communication channel, then cancels sending data after that.
This command is issued for application regularly.

[Form] <hexadecimal> 1B 06 02 00 0B ED

[Return Value]

Returns response packets.(Application → Projector)



3.2 Screen Control

Controls display screen. Each function is as follows.

Input Source(Group : 1 Item : 0)

Input Source Adjustment

[Function] Sets input source.

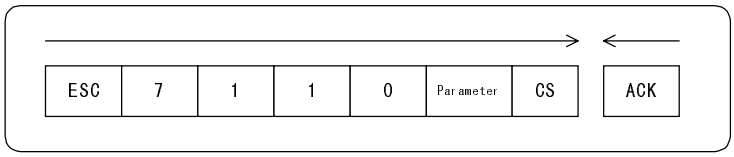
[Form] <hexadecimal> 1B 07 01 01 00 Parameter CS

[Parameter]

This parameter specifies the data of input source.

Possible Data for Setting :

No Signal	:	0 x 0 0 (only EMP-ELP-3500 is available)
PC1	:	0 x 1 0
PC2	:	0 x 1 1
Video	:	0 x 2 0



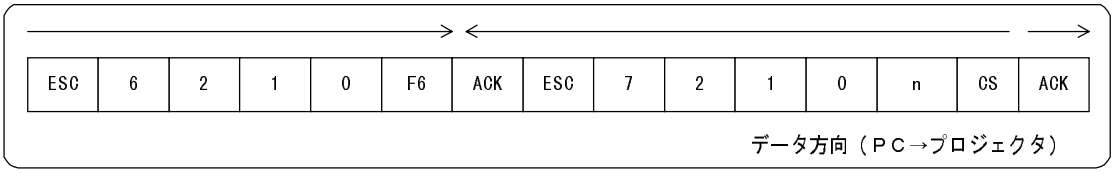
Get Input Source

[Function] Gets the present input source.

[Form] <hexadecimal> 1B 06 02 01 00 F7

[Return Value]

Returns the present input source.



Initialize Input Source

[Function] Initializes input source.

[Form] <hexadecimal> 1B 06 03 01 00 F6

Input Mode(Group : 1 Item : 1)

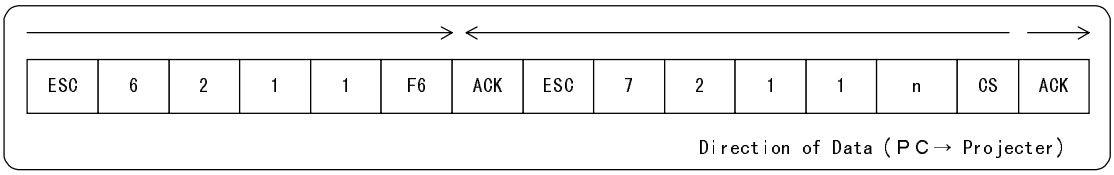
Get Input Mode

[Function] Gets the present input mode.

[Form] <hexadecimal> 1B 06 02 01 01 F6

[Return Value]

Returns the present input mode.



n : Mode Number

(For EMP/ELP-3500)

Mode Name	Mode Number	Mode Name	Mode Number
No modes	0x00	SVGA56	0x08
MAC16	0x01	MAC13	0x09
XGA	0x02	VGA	0x0A
SVGA72	0x03	PC98	0x0B
SVGA75	0x04	EGA	0x0C
VESA72	0x05	NTSC	0x0E
SVGA60	0x06	PAL	0x0F
VESA75	0x07	SECAM	0x10

(For EMP/ELP-5000, 5100, 7000 and 7100)

Mode Name		Mode Number	Mode Name		Mode Number
No modes	:	00	1024 x 768@60H z	:	19
E G A	:	01	1024 x 768@70H z	:	1A
V G A T E X T	:	02	1024 x 768@75H z	:	1B
V G A 2 5 6	:	03	1024 x 768@85H z	:	1C
V G A E G A	:	04	N T S C	:	1D
VG A C G A	:	05	P A L	:	1E
P C -9 8 Normal	:	06	S E C A M	:	1F
M A C 19” R G B	:	07	Not supported	:	20
M A C 19” R G B 60	:	08			
M A C 16” R G B	:	09			
M A C II 13” R G B	:	0A			
M A C L C 13” R G B	:	0B			
M A C L C 12” R G B	:	0C			
640 x 350@85H z	:	0D			
640 x 400@85H z	:	0E			
720 x 400@85H z	:	0F			
640 x 480@60H z	:	10			
640 x 480@72H z	:	11			
640 x 480@75H z	:	12			
640 x 480@85H z	:	13			
800 x 600@56H z	:	14			
800 x 600@60H z	:	15			
800 x 600@72H z	:	16			
800 x 600@75H z	:	17			
800 x 600@85H z	:	18			

Freeze(Group : 1 Item : 2)

Freeze Setting

[Function] Sets freeze setting or cancels it.

[Form] <hexadecimal> 1B 07 01 01 02 Parameter CS

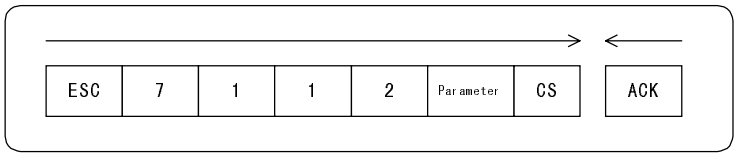
[Parameter]

This parameter specifies the data for Freeze ON/OFF.

Possible Data for Setting :

O F F : 00

O N : 01



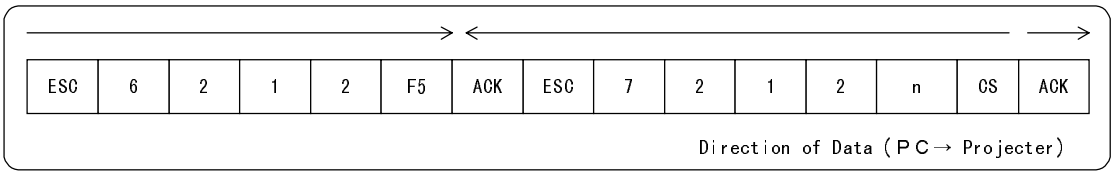
Get Freeze State

[Function] Gets the present freeze state.

[Form] <hexadecimal> 1B 06 02 01 02 F5

[Return Value]

Returns the present freeze state.



Initialize Freeze State

[Function] Initializes freeze state.

[Form] <hexadecimal> 1B 06 03 01 02 F4

Pause(Group : 1 Item : 3)

Pause Setting

[Function] Sets pause setting or cancels it.

[Form] <hexadecimal> 1B 07 01 01 03 Parameter CS

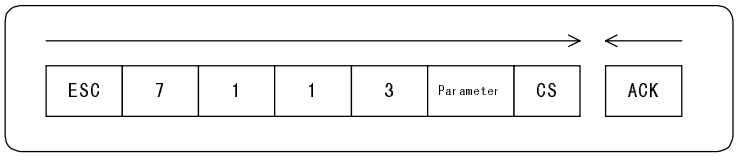
[Parameter]

This parameter specifies the data for Pause ON/OFF.

Possible Data for Setting :

O F F : 00

O N : 01



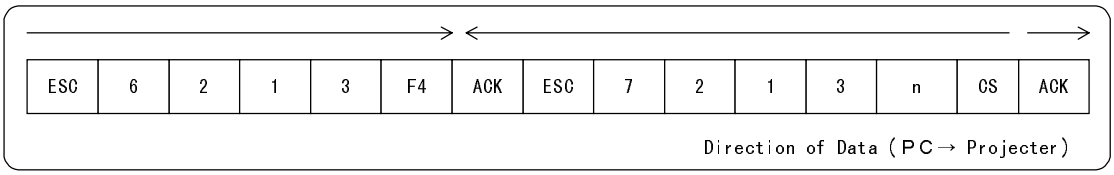
Get Pause State

[Function] Gets the present pause state.

[Form] <hexadecimal> 1B 06 02 01 03 F4

[Return Value]

Returns the present pause state.



Initialize Pause State

[Function] Initializes pause state.

[Form] <hexadecimal> 1B 06 03 01 03 F3

3.3 Audio Control

Controls audio. Each function for the Audio Control is as follows.

Volume(Group : 2 Item : 0)

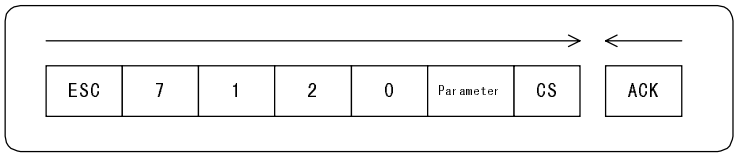
Adjusting Volume Value

[Function] Sets volume for the sound input presently selected.

[Form] <hexadecimal> 1B 07 01 02 00 Parameter CS

[Parameter]

This parameter specifies value for the setting.



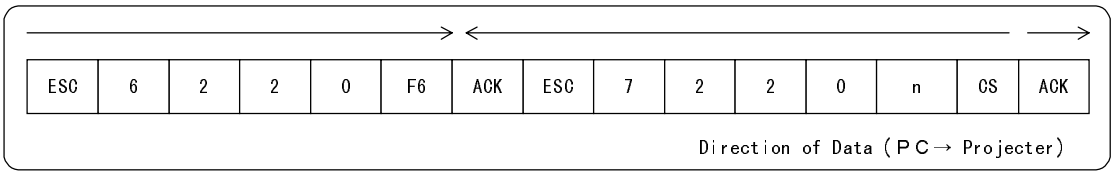
Get Volume Value

[Function] Gets the present volume value.

[Form] <hexadecimal> 1B 06 02 02 00 F6

[Return Value]

Returns the present volume value.



Initialize Volume Value

[Function] Initializes volume value.

[Form] <hexadecimal> 1B 06 03 02 00 F5

Tone(Group : 2 Item : 1)

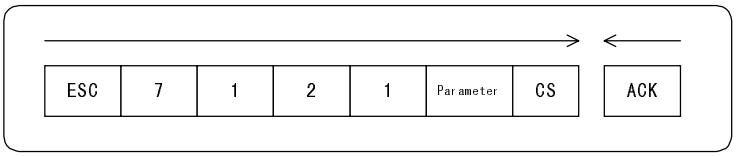
Adjusting Tone Value

[Function] Sets tone value for the sound input presently selected.

[Form] <hexadecimal> 1B 07 02 01 02 01 Parameter CS

[Parameter]

This parameter specifies tone value to set.



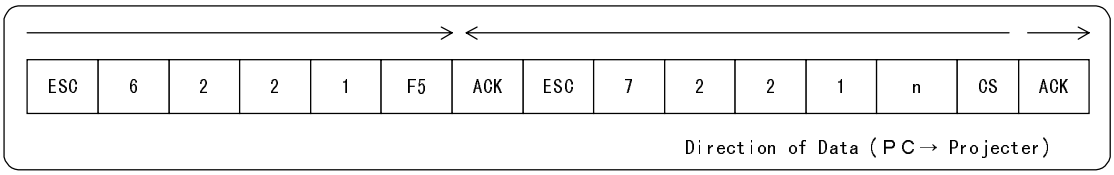
Get Tone Value

[Function] Gets the present tone value.

[Form] <hexadecimal> 1B 06 02 02 01 F5

[Return Value]

Returns the present tone value.



Initialize Tone Value

[Function] Initializes tone values.

[Form] <hexadecimal> 1B 06 03 02 01 F4

Loudness(Group : 2 Item : 2)

Loudness Setting

[Function] Sets Loudness ON or OFF to the sound input presently selected.

[Form] <hexadecimal> 1B 07 01 02 02 Parameter CS

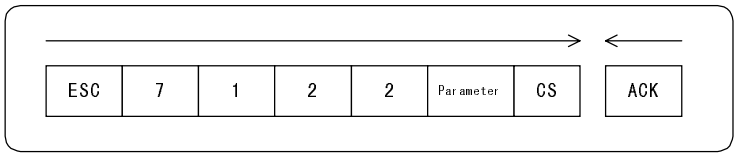
[Parameter]

This parameter specifies the data for Loudness ON/OFF.

Possible Data for Setting :

O F F : 00

O N : 01



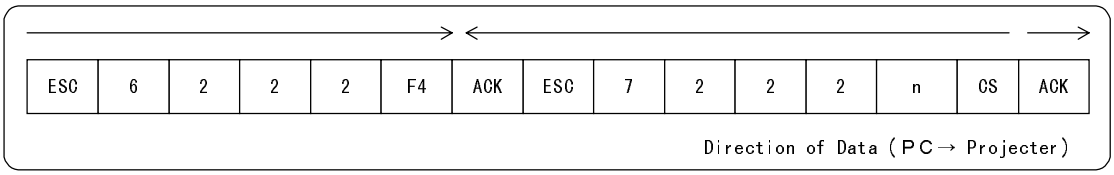
Get Loudness State

[Function] Gets the present loudness value.

[Form] <hexadecimal> 1B 06 02 02 02 F4

[Return Value]

Returns the present loudness value.



Initialize Loudness State

[Function] Initializes loudness state.

[Form] <hexadecimal> 1B 06 03 02 02 F3

Mute(Group : 2 Item : 3)

Mute Setting

[Function] Sets mute ON or OFF to the sound input presently selected.

[Form] <hexadecimal> 1B 07 01 02 03 Parameter CS

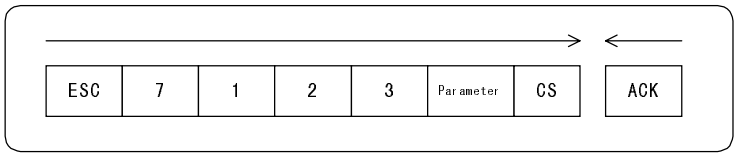
[Parameter]

This parameter specifies data for Mute ON/OFF.

Possible Data for Setting :

O F F : 00

O N : 01



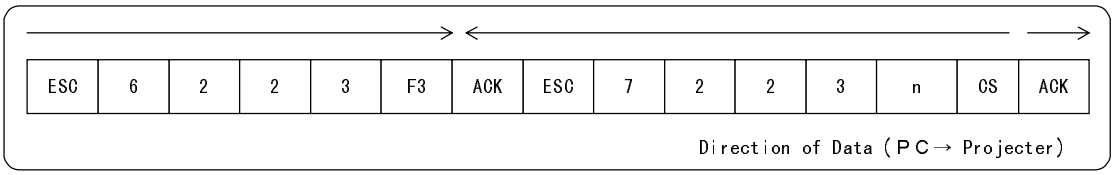
Get Mute State

[Function] Gets the present mute state.

[Form] <hexadecimal> 1B 06 02 02 03 F3

[Return Value]

Returns the present mute state.



Initialize Mute State

[Function] Initializes mute state.

[Form] <hexadecimal> 1B 06 03 02 03 F2

SPECIALIZER(Group : 2 Item : 4)

Adjusting Specializer

[Function] Sets specializer to the sound presently selected.

[Form] <hexadecimal> 1B 07 01 02 04 Parameter CS

[Parameter]

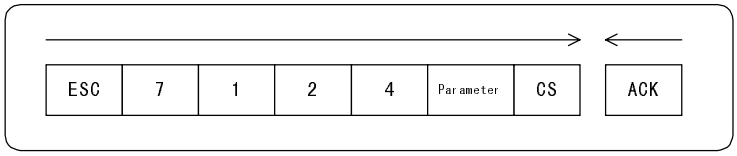
This parameter specifies the data supports for the sound effect.

Possible Data for Setting :

No sound effect : 00

Normal : 01

Wide : 02



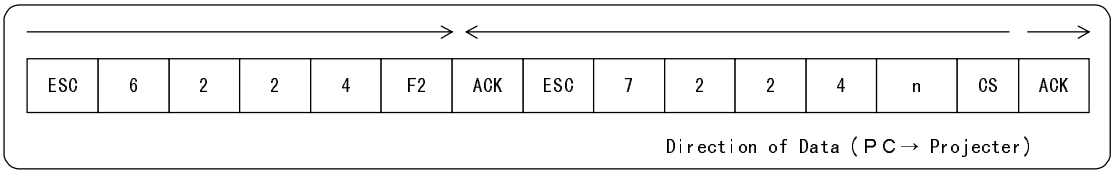
Get Specializer

[Function] Gets the present specializer.

[Form] <hexadecimal> 1B 06 02 02 04 F2

[Return Value]

Returns the present specializer.



Initialize the Specializer

[Function] Initializes the present specializer.

[Form] <hexadecimal> 1B 06 03 02 04 F1

3.4 PC Image Control

Controls the images for the PC. Each function for PC is as shown below.

Brightness(Group : 3 Item : 0)

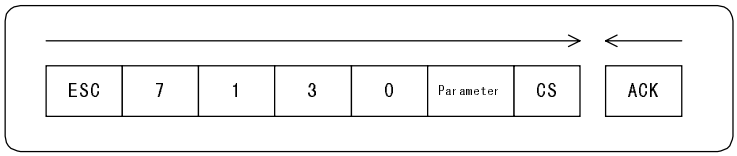
Adjusting Brightness Value

[Function] Sets brightness for screens.

[Form] <hexadecimal> 1B 07 01 03 00 Parameter CS

[Parameter]

This parameter specifies the brightness to set.



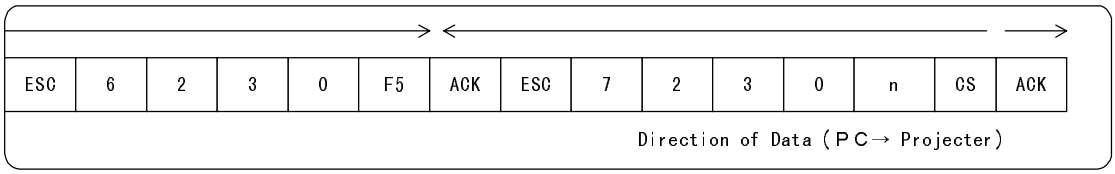
Get Brightness Value

[Function] Gets the present brightness.

[Form] <hexadecimal> 1B 06 02 03 00 F5

[Return Value]

Returns the present brightness.



Initialize Brightness Value

[Function] Initializes brightness values for screens.

[Form] <hexadecimal> 1B 06 03 03 00 F4

Contrast(Group : 3 Item : 1)

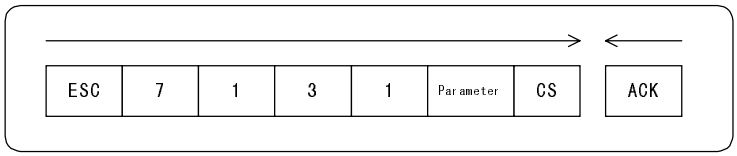
Adjusting Contrast Value

[Function] Sets contrast values for screens.

[Form] <hexadecimal> 1B 07 03 01 Parameter CS

[Parameter]

This parameter specifies the contrast values to set.



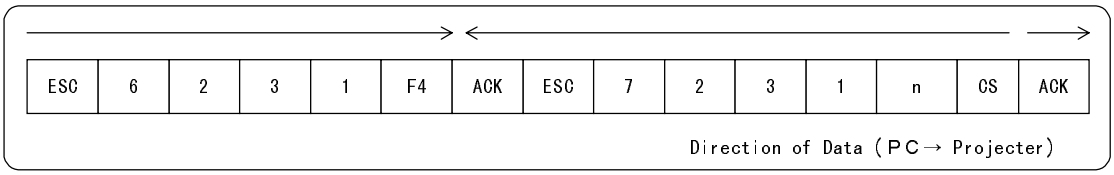
Get Contrast Value

[Function] Gets the present contrast values.

[Form] <hexadecimal> 1B 06 02 03 01 F4

[Return Value]

Returns the present contrast values.



Initialize Contrast Value

[Function] Initializes contrast values for screens.

[Form] <hexadecimal> 1B 06 03 03 01 F3

Synchronization(Group : 3 Item : 2)

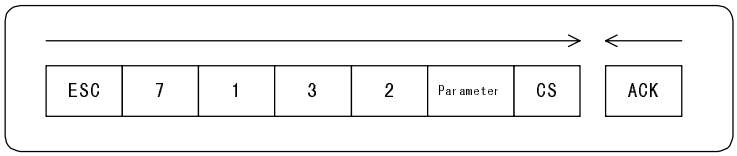
Sync Adjustment

[Function] Sets phases for sampling clock.

[Form] <hexadecimal> 1B 07 01 03 02 Parameter CS

[Parameter]

This parameter specifies the sync value to set.



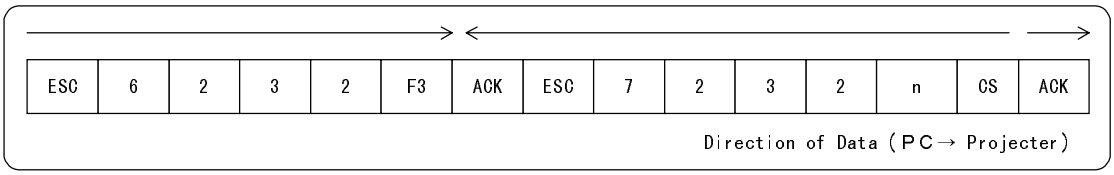
Get Sync Value

[Function] Gets the present sync values.

[Form] <hexadecimal> 1B 06 02 03 02 F3

[Return Value]

Returns the present sync values.



Initialize Sync Value

[Function] Initializes sync values.

[Form] <hexadecimal> 1B 06 03 03 02 F2

Tracking(Group : 3 Item : 3)

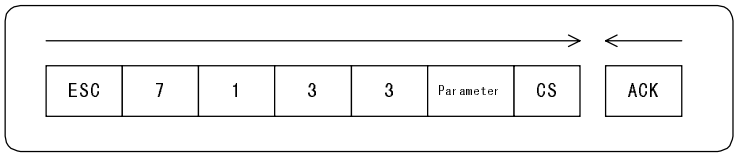
Adjusting Tracking Value

[Function] Adjusts number of sample for input signal.

[Form] <hexadecimal> 1B 07 01 03 03 Parameter CS

[Parameter]

This parameter specifies the tracking value to set.



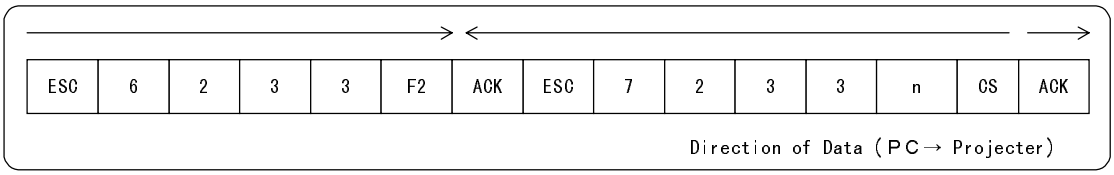
Get Tracking Value

[Function] Gets the present tracking values.

[Form] <hexadecimal> 1B 06 02 03 03 F2

[Return Value]

Returns the present tracking values.



Initialize Tracking Value

[Function] Initializes tracking values.

[Form] <hexadecimal> 1B 06 03 03 03 F1

Tracking Base(Group : 3 Item : 4)

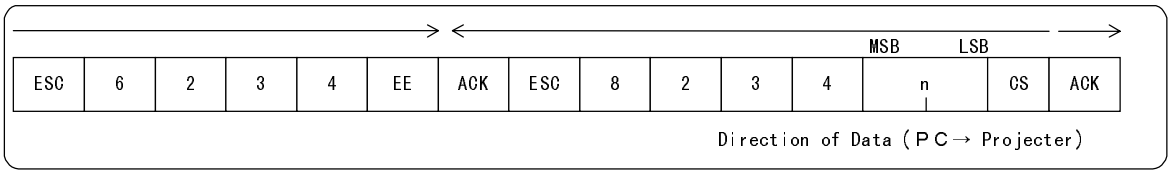
Get Tracking Base

[Function] Gets the present tracking base.

[Form] <hexadecimal> 1b 06 02 03 04 EE

[Return Value]

Returns the present tracking base.



Mouse/Serial Port fixed(Group : 3 Item : 5)

Designating Mouse/Serial Port fixed

[Function] Sets mouse/serial port fixed.

[Form] <hexadecimal> 1B 07 01 03 05 Parameter CS

[Parameter]

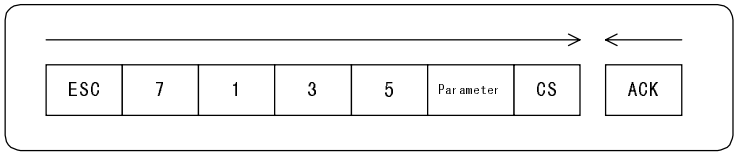
This parameter specifies the data to support for ports.

Possible Data for Setting :

Not fixed : 00

P C 1 : 01

P C 2 : 02



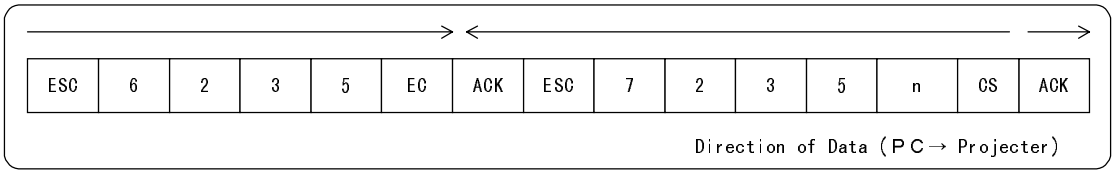
Get State of Mouse/Serial Port fixed

[Function] Gets the present state of mouse/serial port fixed.

[Form] <hexadecimal> 1B 06 02 03 05 EC

[Return Value]

Returns the present state of mouse /serial port fixed.



Initialize Mouse/Serial Port fixed

[Function] Initializes the state of mouse/serial port fixed.

[Form] <hexadecimal> 1B 06 03 03 05 EB

Color Red Level(Group : 3 Item : 6)

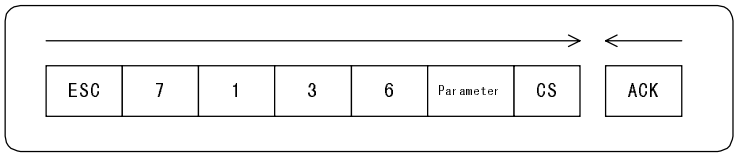
Adjusting Color Red Level Value

[Function] Sets color red level for the screen to the input source presently selected.

[Form] <hexadecimal> 1B 07 01 03 06 Parameter CS

[Parameter]

This parameter specifies the red level to set.



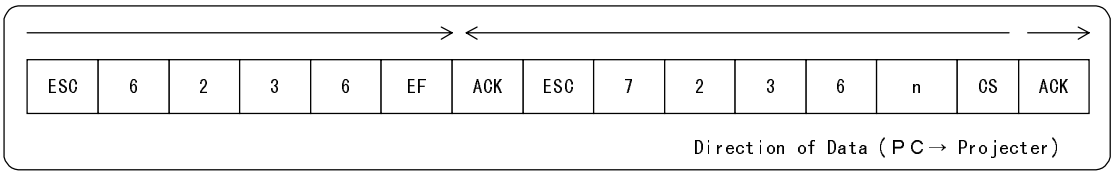
Get Color Red Level Value

[Function] Get the present color red level to the input source presently selected.

[Form] <hexadecimal> 1B 06 02 03 06 EF

[Return Value]

Returns the present color red level value.



Initialize Color Red Level Value

[Function] Initializes the present color red level to the input source presently selected.

[Form] <hexadecimal> 1B 06 03 03 06 EE

Color Green Level(Group : 3 Item : 7)

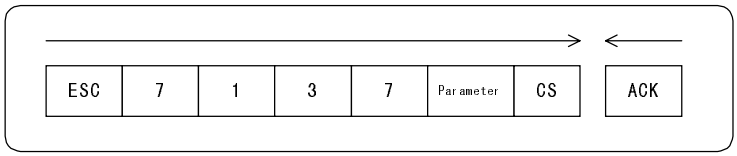
Adjusting Color Green Level Value

[Function] Sets color green level for screens to the input source presently selected.

[Form] <hexadecimal> 1B 07 01 03 07 Parameter CS

[Parameter]

This parameter specifies the color green level to set.



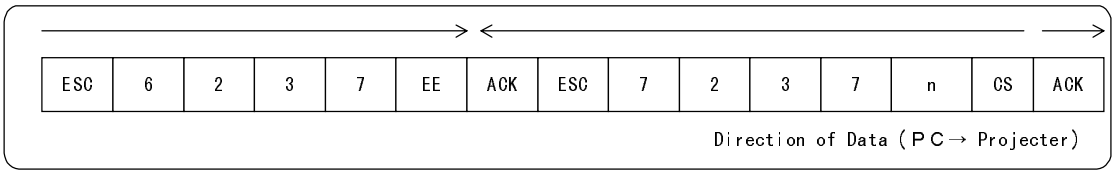
Get Color Green Level Value

[Function] Gets the present color green level to the input source presently selected.

[Form] <hexadecimal> 1B 06 02 03 07 EE

[Return Value]

Returns the present color green level.



Initialize Color Green Level Value

[Function] Initializes the present color level to the input source presently selected.

[Form] <hexadecimal> 1B 06 03 03 07 ED

Color Blue Level(Group : 3 Item : 8)

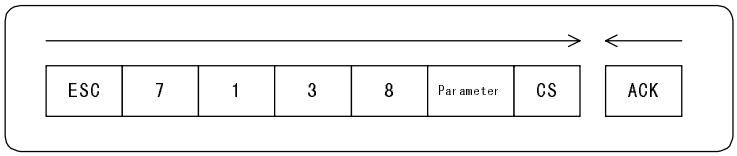
Adjusting Color Blue Level

[Function] Sets color blue level for screens to input source presently selected.

[Form] <hexadecimal> 1B 07 01 03 03 Parameter CS

[Parameter]

This parameter specifies the color blue level to set.



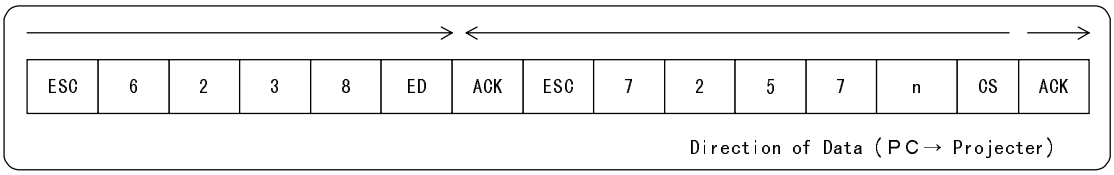
Get Color Blue Level Value

[Function] Gets the present color blue level to the input source presently selected.

[Form] <hexadecimal> 1B 06 02 03 03 ED

[Return Value]

Returns the present color blue level.



Initialize Color Blue Level Value

[Function] Initializes the present color blue level to the input source presently selected.

[Form] <hexadecimal> 1B 06 03 03 08 EC

3.5 Video Image Quality Control

Controls image quality for Video. Each function for the video image quality control is as shown below.

Brightness (Group : 4 Item : 0)

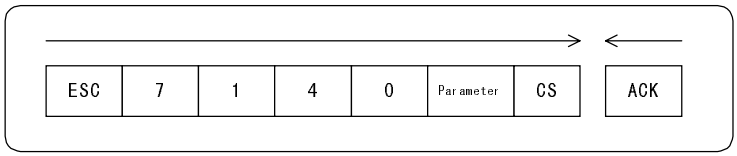
Adjusting Brightness Value

[Function] Sets brightness for screens.

[Form] <hexadecimal> 1B 07 01 04 00 Parameter CS

[Parameter]

This parameter specifies the brightness to set.



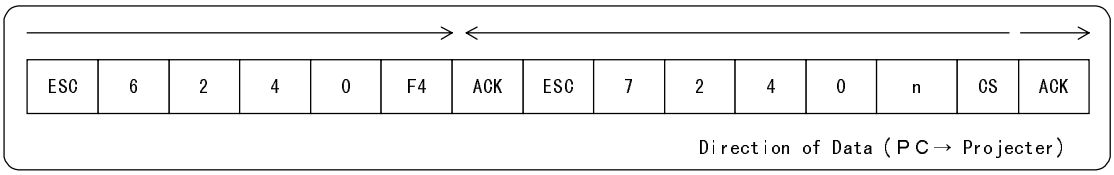
Get Brightness Value

[Function] Gets the present brightness.

[Form] <hexadecimal> 1B 06 02 04 00 F4

[Return Value]

Returns the present brightness.



Initialize Brightness Value

[Function] Initializes brightness.

[Form] <hexadecimal> 1B 06 03 04 00 F3

Contrast(Group : 4 Item : 1)

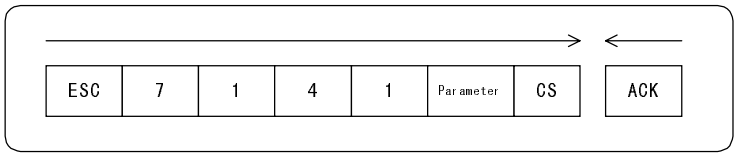
Adjusting Contrast Value

[Function] Sets contrast for screens.

[Form] <hexadecimal> IB 07 01 04 01 Parameter CS

[Parameter]

This parameter specifies the contrast value to set.



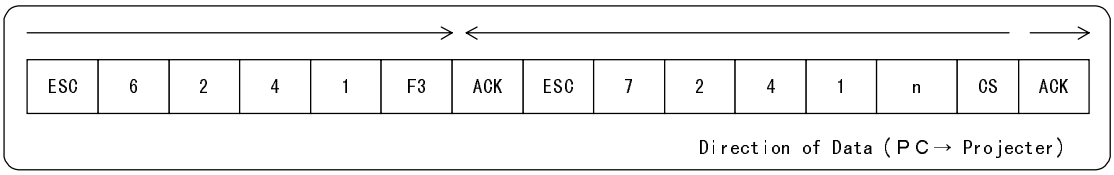
Get Contrast Value

[Function] Gets the present contrast value.

[Form] <hexadecimal> 1B 06 02 04 01 F3

[Return Value]

Returns the present contrast value.



Initialize Contrast Value

[Function] Initializes contrast values.

[Form] <hexadecimal> 1B 06 03 04 01 F2

Sharpness(Group : 4 Item : 2)

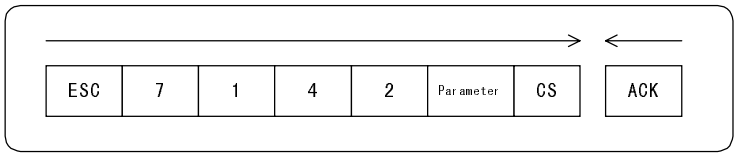
Adjusting Sharpness

[Function] Sets sharpness for screens.

[Form] <hexadecimal> 1B 07 01 04 02 Parameter CS

[Parameter]

This parameter specifies the sharpness value to set.



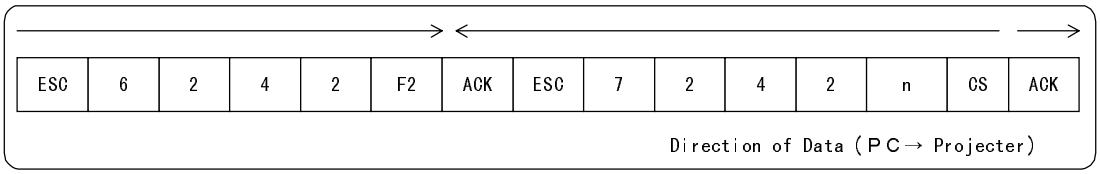
Get Sharpness Value

[Function] Gets the present sharpness value.

[Form] <hexadecimal> 1B 06 02 04 02 F2

[Return Value]

Returns the present sharpness value.



Initialize Sharpness Value

[Function] Initializes sharpness value.

[Form] <hexadecimal> 1B 06 03 04 02 F1

Saturation(Group : 4 Item : 3)

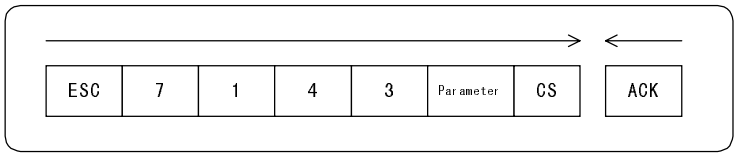
Adjusting Saturation

[Function] Sets saturation for screens.

[Form] <hexadecimal> 1B 07 01 04 03 Parameter CS

[Parameter]

This parameters specifies the saturation to set.



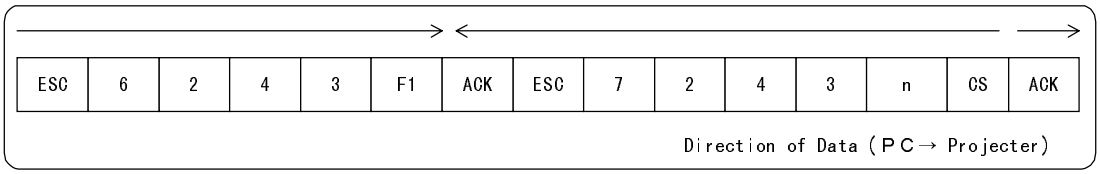
Get Saturation

[Function] Gets the present saturation.

[Form] <hexadecimal> 1B 06 02 04 03 F1

[Return Value]

Returns the present saturation.



Initialize Saturation

[Function] Initializes saturation.

[Form] <hexadecimal> 1B 06 03 04 03 F0

Tint(Group : 4 Item : 4)

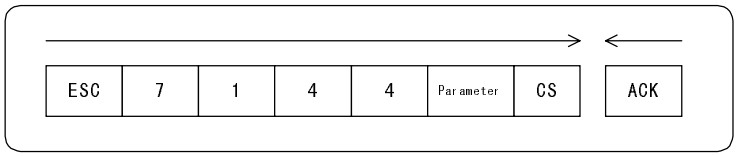
Adjusting Tint

[Function] Sets tint for screens.

[Form] <hexadecimal> 1B 07 01 04 04 Parameter CS

[Parameter]

This parameter specifies the tint to set.



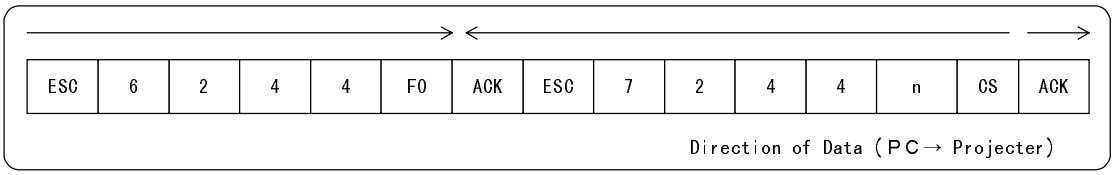
Get Tint

[Function] Gets the present tint.

[Form] <hexadecimal> 1B 06 02 04 04 F0

[Return Value]

Returns the present tint.



Initialize Tint

[Function] Initializes tint.

[Form] <hexadecimal> 1B 06 03 04 04 EF

Video Mode(Group : 4 Item : 5)

Video Mode Setting

[Function] Sets signal method for the video input.

[Form] <hexadecimal> 1B 07 01 04 05 Parameter CS

[Parameter]

This parameter specifies the data to support for the video mode you set.

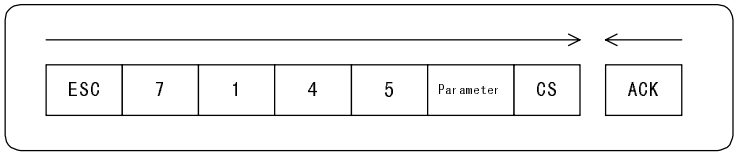
Possible Data for Setting :

A U T O : 00

N T S C : 01

P A L : 02

S E C A M : 03



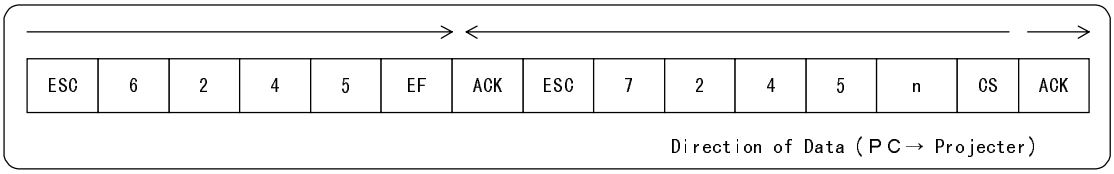
Get Video Mode

[Function] Gets the present video mode.

[Form] <hexadecimal> 1B 06 02 04 05 EE

[Return Value]

Returns the present video mode.



Initialize Video Mode

[Function] Initializes video mode.

[Form] <hexadecimal> 1B 06 03 04 05 ED

3.6 Display Control

Controls the display. Each function for the display control is as shown below.

Horizontal Position(Group : 5 Item : 0)

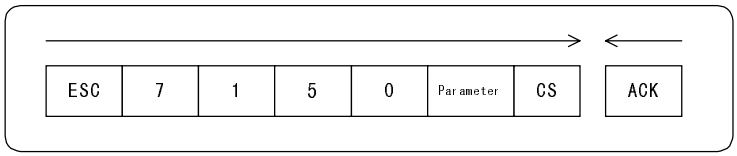
Adjusting Horizontal Position

[Function] Sets horizontal position on screens.

[Form] <hexadecimal> 1B 07 01 05 00 Parameter CS

[Parameter]

This parameter specifies the horizontal position to set.



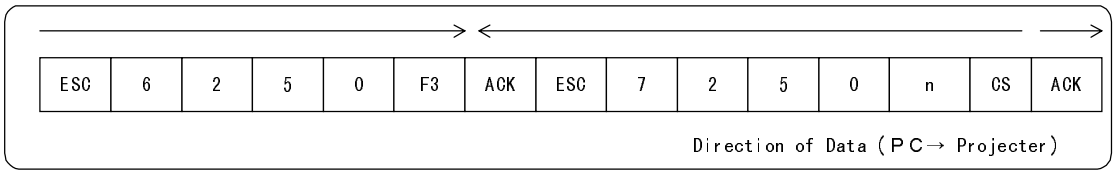
Get Horizontal Position

[Function] Gets the present horizontal position.

[Form] <hexadecimal> 1B 07 02 05 F3

[Return Value]

Returns the present horizontal position.



Initialize Horizontal Position

[Function] Initializes horizontal position.

[Form] <hexadecimal> 1B 06 03 05 00 F2

Vertical Position(Group : 5 Item : 1)

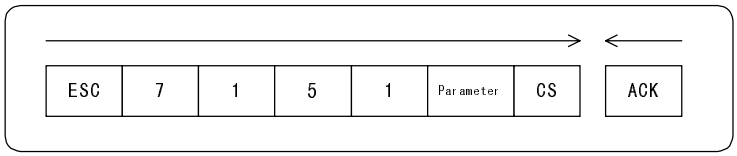
Adjusting Vertical Position

[Function] Sets vertical position on screens.

[Form] <hexadecimal> 1B 07 01 05 01 Parameter CS

[Parameter]

This parameter specifies the vertical position to set.



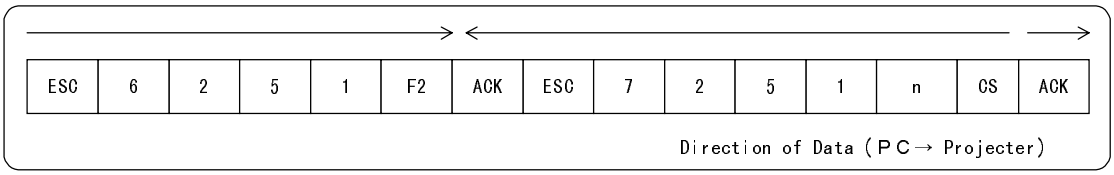
Get Vertical Position

[Function] Gets the present vertical position.

[Form] <hexadecimal> 1B 06 02 05 01 F2

[Return Value]

Returns the present vertical position.



Initialize Vertical Position

[Function] Initializes vertical position.

[Form] <hexadecimal> 1B 06 03 05 01 F1

Rear Proj(Group : 5 Item : 2)

Rear Proj Setting

[Function] Specifies Rear Proj for projecting screens.

[Form] <hexadecimal> 1B 07 01 05 02 Parameter CS

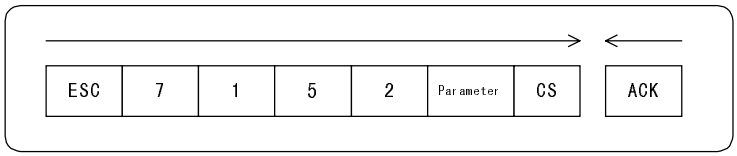
[Parameter]

This parameter specifies the data to support for Rear Proj ON/OFF.

Possible Data for Setting :

O F F : 00

O N : 01



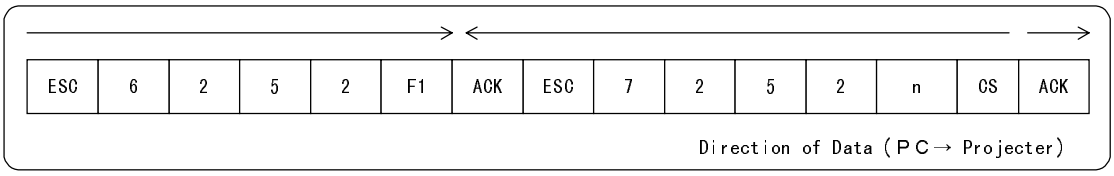
Get State of Rear Proj

[Function] Gets the present state of the Rear Proj.

[Form] <hexadecimal> 1B 06 02 05 02 F1

[Return Value]

Returns the present state of the Rear Proj.



Initialize Rear Proj

[Function] Initializes Rear Proj.

[Form] <hexadecimal> 1B 06 03 05 02 F0

Upside Down(Group : 5 Item : 3)

Adjusting Upside Down

[Function] Specifies Upside Down for projecting screens.

[Form] <hexadecimal> 1B 07 01 05 03 Parameter CS

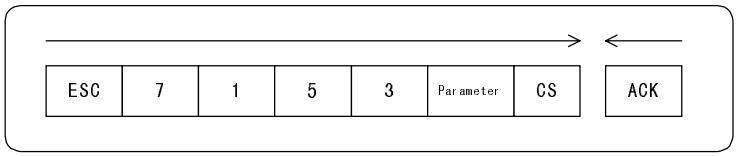
[Parameter]

This parameter specifies the data supports for Upside Down ON/OFF.

Possible Data for Setting :

O F F : 00

O N : 01



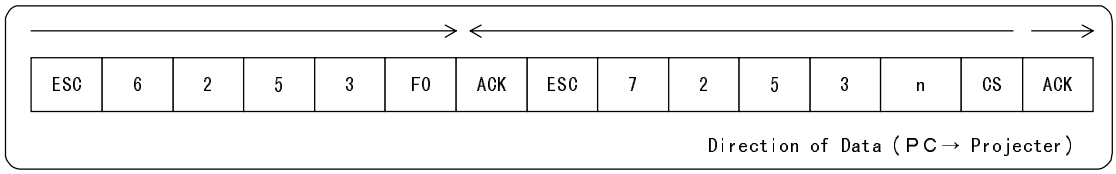
Get State of Upside Down

[Function] Get the present state of Upside Down.

[Form] <hexadecimal> 1B 06 02 05 03 F0

[Return Value]

Returns the present state of Upside Down.



Initialize Upside Down

[Function] Initializes Upside Down.

[Form] <hexadecimal> 1B 06 03 05 03 EF

Color Temp (Group : 5 Item : 4)

Specifying Color Temp

[Function] Sets color temperature for screens to the input source presently selected.

[Form] <hexadecimal> 1B 07 01 05 04 Parameter CS

[Parameter]

This parameter specifies the data supports for the color temp to set.

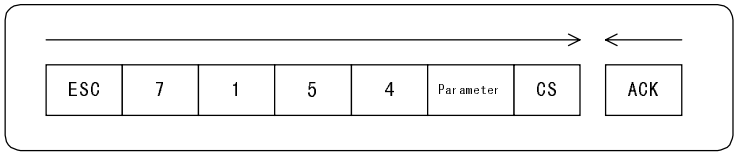
Possible Data for Setting :

C O L O R 1 (H) : 00

C O L O R 2 (M) : 01

C O L O R 3 (L) : 02

U S E R : 03



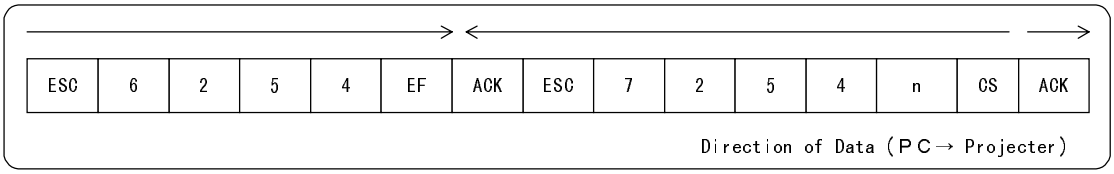
Get Color Temp

[Function] Gets the present color temperature.

[Form] <hexadecimal> 1B 06 02 05 04 EF

[Return Value]

Returns the present color temperature.



Initialize Color Temp

[Function] Initializes color temperature.

[Form] <hexadecimal> IB 06 03 05 04 EE

Red Level of Color Temp (Group : 5 Item : 5)

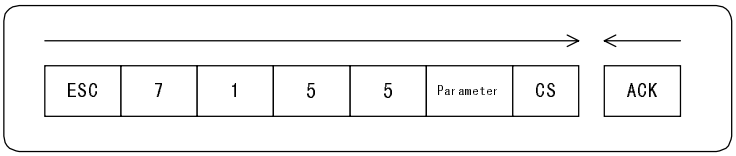
Adjusting Red Level Value of Color Temp

[Function] Sets red level for screens to the input source presently selected.

[Form] <hexadecimal> 1B 07 01 05 05 Parameter CS

[Parameter]

This parameter specifies the red level to set.



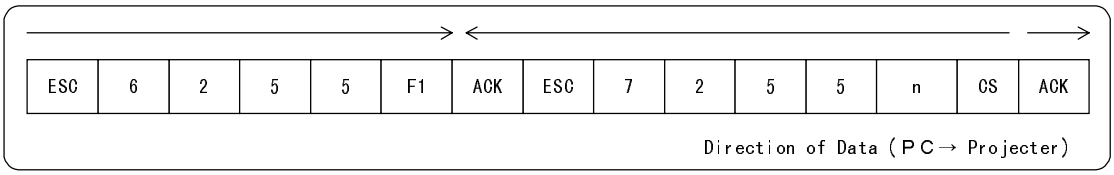
Get Red Level Value of Color Temp

[Function] Gets the present red level to the input source presently selected.

[Form] < hexadecimal> 1B 06 02 05 05 F1

[Return Value]

Returns the present red level value.



Initialize Red Level Value of Color Temp

[Function] Initializes the present red level to the input source presently selected.

[Form] <hexadecimal> IB 06 03 05 05 F0

Green Level of Color Temp (Group : 5 Item : 6)

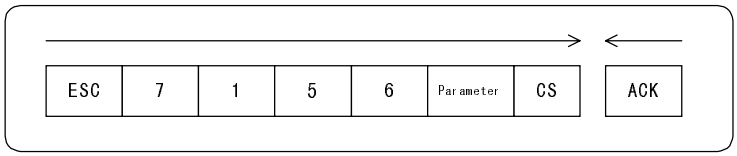
Adjusting Green Level Value of Color Temp

[Function] Sets green level for screens to the input source presently selected.

[form] <hexadecimal> 1B 07 01 05 06 Parameter CS

[Parameter]

This parameter specifies the green level to set.



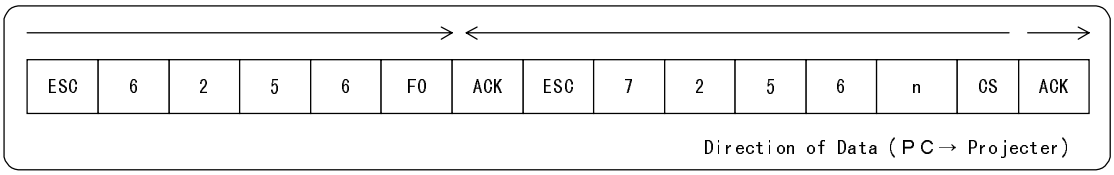
Get Green Level Value of Color Temp

[Function] Gets the present green level to the input source presently selected.

[Form] <hexadecimal> 1B 06 02 05 06 F0

[Return Value]

Returns the present green level value.



Initialize Green Level Value of Color Temp

[Function] Initializes the present green level to the input source presently selected.

[Form] <hexadecimal> 1B 06 03 05 06 EF

Blue Level of Color Temp (Group : 5 Item : 7)

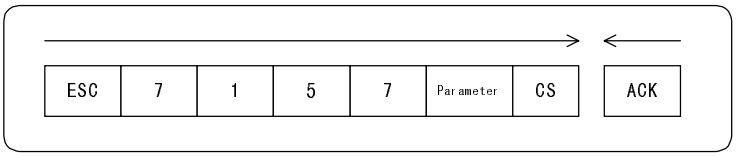
Adjusting Blue Level Value of Color Temp

[Function] Sets blue level for screens to the input source presently selected.

[Form] <hexadecimal> 1B 07 01 05 07 Parameter CS

[Parameter]

This parameter specifies the blue level to set.



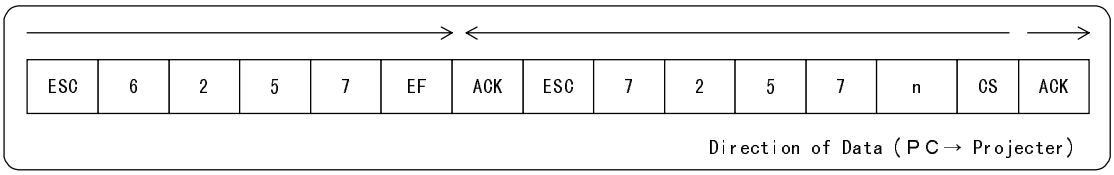
Get Blue Level Value of Color Temp

[Function] Gets the present blue level to the input source presently selected.

[Form] <hexadecimal> 1B 06 02 05 07 EF

[Return Value]

Returns the present blue level.



Initialize Blue Level Value of Color Temp

[Function] Initializes the present blue level to the input source presently selected.

[Form] <hexadecimal> 1B 06 03 05 07 EE

3.7 Option

Sets added function for the projector in Option. Each function is as shown blow.

Display Languages (Group : 6 Item : 0)

Display Languages Setting

[Function] Specifies a language to display menu.

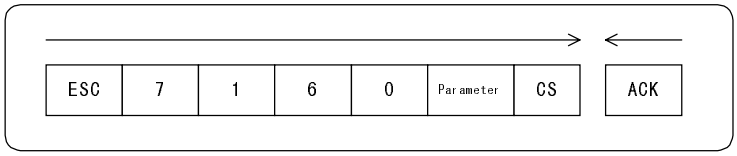
[Form] <hexadecimal> 1B 07 01 06 00 Parameter CS

[Parameter]

This parameter specifies the data to each languages.

Possible Data for Setting :

(EMP/ELP-3500)			(EMP/ELP-5000, 5100, 7000, 7100)		
English	:	00	Japanese	:	00
Japanese	:	01	English	:	01
German	:	02	French	:	02
French	:	03	German	:	03
Spanish	:	04	Italian	:	04
Italian	:	05	Spanish	:	05
			Portuguese	:	06



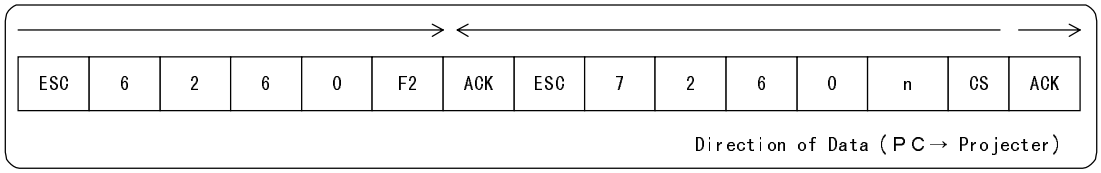
Get Display Languages

[Function] Gets the present display language.

[Form] <hexadecimal> 1B 06 02 06 00 F2

[Return Value]

Returns the present display language.



Initialize Display Languages

[Function] Initializes the present display language.

[Form] <hexadecimal> 1B 06 03 06 F1

Power Save (Group : 6 Item : 1)

Adjusting Power Save

[Function] Specifies the operation to get standby mode when turn off a lamp if there is no image signal in the display mode.

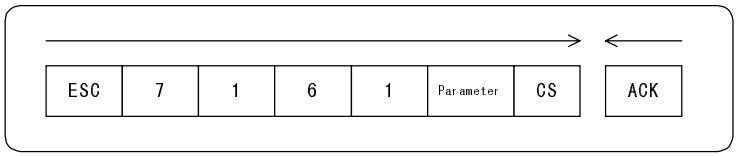
[Form] < hexadecimal> 1B 07 01 06 01 Parameter CS

[Parameter]

This parameters specifies the time of power save to set.

Possible Range for Setting : <hexadecimal> No Power Save : 00

Specify Power Save : 05 to 3C (5 units)



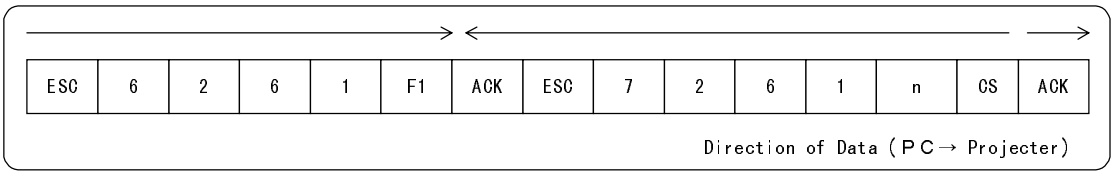
Get State of Power Save

[Function] Gets the present state of Power Save.

[Form] <hexadecimal> 1B 06 02 06 01 F1

[Return Value]

Returns the present state of Power Save.



Initialize State of Power Save

[Function] Initializes the state of Power Save.

[Form] <hexadecimal> 1B 06 03 06 01 F0

Source Prompt (Group : 6 Item : 3)

Source Prompt Display Setting

[Function] Specifies displays for input sources when selects a input source.

[Form] <hexadecimal> 1B 07 01 06 03 Parameter CS

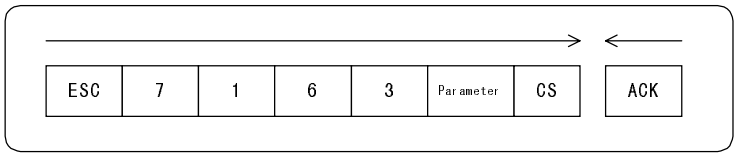
[Parameter]

This parameter specifies the data to ON or OFF.

Possible Data for Setting :

O F F : 00

O N : 01



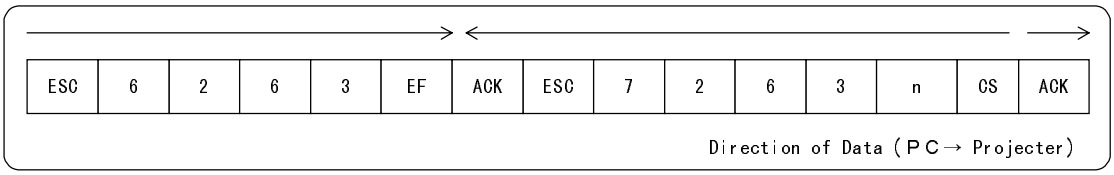
Get State of Source Prompt Display

[Function] Gets the present source prompt.

[Form] <hexadecimal> 1B 06 02 06 03 EF

[Return Value]

Returns the present state of source prompt display.



Initialize State of Source Prompt Display

[Function] Initializes the state of source prompt display.

[Form] <hexadecimal> 1B 06 03 06 03 EE

Blank Color (Group : 6 Item : 4)

Blank Color Setting

[Function] Specifies colors for screens when the screens are clear.

[Form] <hexadecimal> 1B 07 01 06 04 Parameter CS

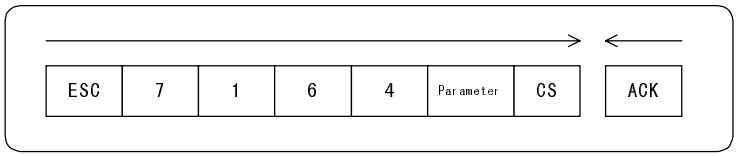
[Parameter]

This parameter specifies the data to blank colors.

Possible Data for Setting :

Black : 00

User Logo : 01



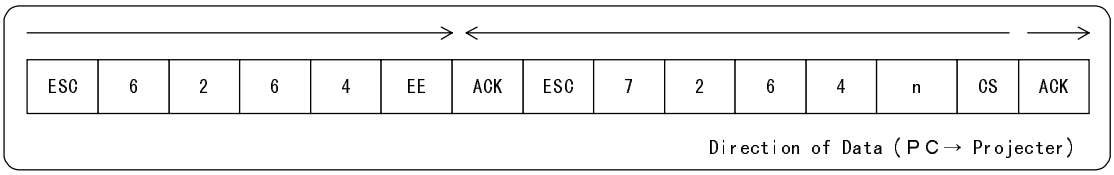
Get Blank Color

[Function] Gets the present blank color.

[Form] <hexadecimal> 1B 06 02 06 04 EE

[Return Value]

Returns the present blank color.



Initialize Blank Color

[Function] Initializes blank colors.

[Form] <hexadecimal> 1B 06 03 06 04 ED

Non-display Area Color (Group : 6 Item : 5)

Non-display Area Color Setting

[Function] Sets colors for non-display area on screens.

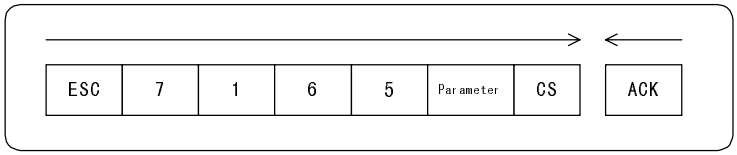
[Form] <hexadecimal> 1B 07 01 06 05 Parameter CS

[Parameter]

This parameter specifies the data to non-display area colors.

Possible Data for Setting :

Black : 00



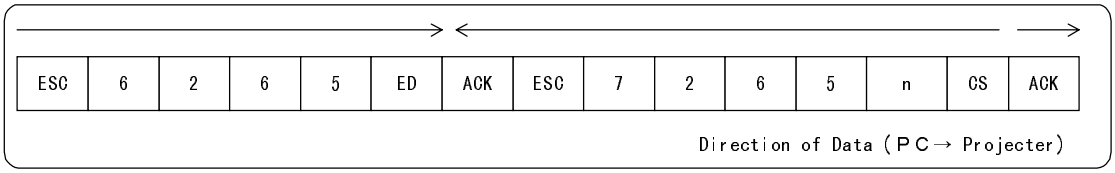
Get Non-display Area Color

[Function] Gets the present non-display area color.

[Form] <hexadecimal> 1B 06 02 06 05 ED

[Return Value]

Returns the present non-display area color.



Initialize Non-display Area Color

[Function] Initializes non-display area colors.

[Form] <hexadecimal> 1B 06 03 06 05 EC

Gamma Table Number (Group : 6 Item : 6)

Gamma Table Number Setting

[Function] Sets gamma table number.

[Form] <hexadecimal> 1B 07 01 06 06 Parameter CS

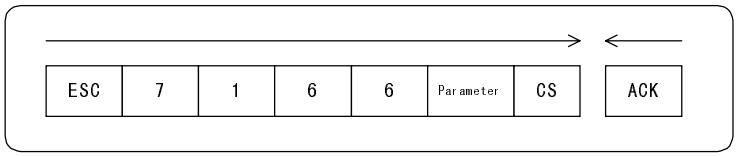
[Parameter]

This parameter specifies the data to gamma table numbers.

Possible Data for Setting :

Gamma 1 : 00

Gamma 2 : 01



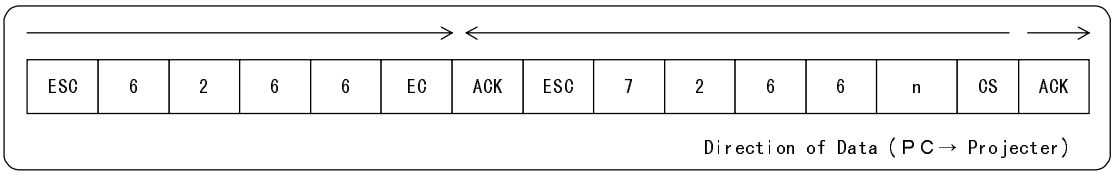
Get Gamma Table Number

[Function] Gets gamma table numbers.

[Form] <hexadecimal> 1B 06 02 06 06 EC

[Return Value]

Returns the present gamma table number.



Initialize Gamma

[Function] Initializes gamma.

[Form] <hexadecimal> 1B 06 03 06 06 EB

Change Screen Mode (Group : 6 Item : 7)

Change Screen Mode Setting

[Function] Sets modes for changing screen.

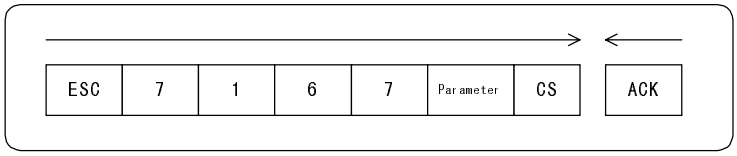
[Form] <hexadecimal> 1B 07 01 06 07 Parameter CS

[Parameter]

This parameter specifies the data to modes when changing screens.

Possible Data for Setting :

O F F	:	00
Left top → Right bottom	:	01
Left → Right	:	02
Edge → Center	:	03



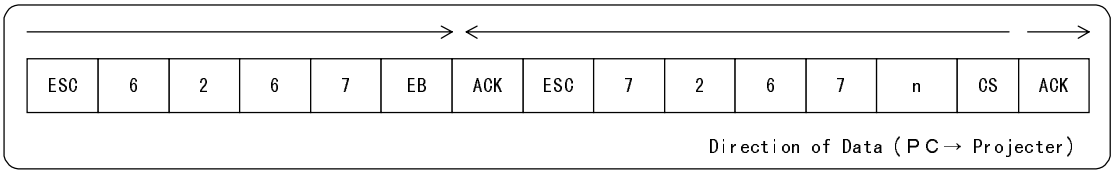
Get Change Screen Mode

[Function] Gets the modes when changing screens.

[Form] <hexadecimal> 1B 06 02 06 07 EB

[Return Value]

Returns the present change screen mode.



Initialize Change Screen Mode

[Function] Initializes the mode when changing screens.

[Form] <hexadecimal> 1B 06 03 06 07 EA

User Gamma (Group : 6 Item : 8)

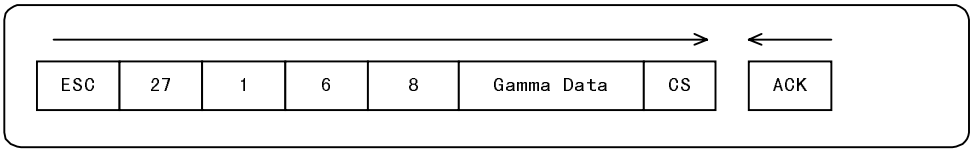
User Gamma Setting

[Function] Sets user gamma data and sends the ideal gamma data which is 33 gradation. The gamma data is reflected immediately after sending all data. But while displaying blank screen, the gamma is not reflected.

[Form] <hexadecimal> 1B 27 01 06 08 Gamma Data CS

[Gamma Data]

Gamma Data : 33 byte (Ideal Gamma Data : 0 to 32)



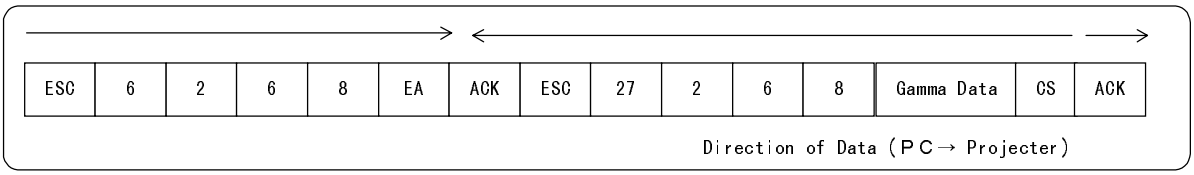
Get User Gamma

[Function] Gets user gamma data. The data is ideal gamma table which is 33 gradation presently set on the firmware.

[Form] <hexadecimal> 1B 06 02 06 08 CS

[Return Value]

Gamma Data 33 byte (Ideal Gamma DatDirection of Data (PC to Projector) a : 0 to 32)



Initialize User Gamma

[Function] Initializes the user gamma set on the projector.

[Form] <hexadecimal> 1B 06 03 06 08 E9

3.8 Custom

Sets added function that user can program. Each function for Custom is as shown below.

Effect Key (Group : 7 Item : 0)

Effect Key

[Function] Indicates that effect keys are pressed.

[Form] <hexadecimal> 1B 07 01 07 00 Parameter CS

[Parameter]

This parameter specifies the data to effect keys.

Possible Data for Setting :

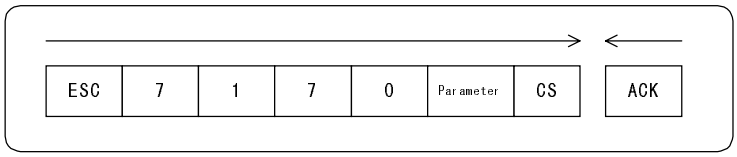
Effect 1 Key : 00

Effect 2 Key : 01

Effect 3 Key : 02

Effect 4 Key : 03

Effect 5 Key : 04



Custom Key Function (Group : 7 Item : 1)

Custom Key Function Setting

[Function] Sets the function assigned to custom keys.

[Form] <hexadecimal> 1B 07 01 07 01 Parameter CS

[Parameter]

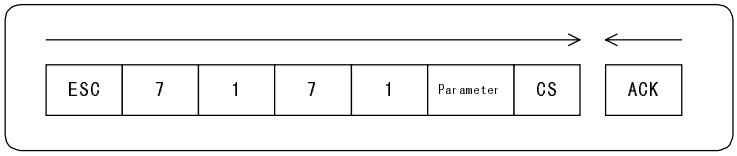
This parameter specifies the data to effect keys.

Possible Data for Setting :

Zoom : 00

Preview : 01

Strobe : 02



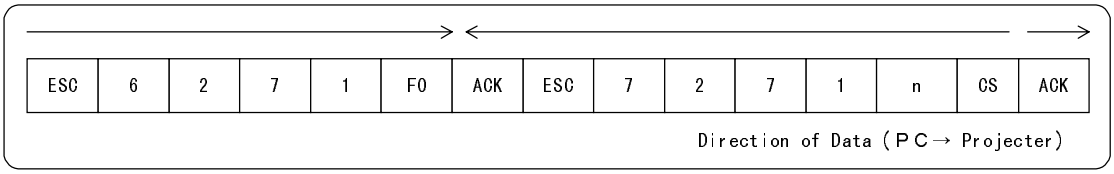
Get Custom Key Function

[Function] Gets the present custom key function.

[Form] <hexadecimal> 1B 06 02 07 01 F0

[Return Value]

Returns the present non-display area color.



Initialize Custom Key Function

[Function] Initializes custom key function.

[Form] <hexadecimal> 1B 06 03 07 01 EF

Counts of Strobe Frames (Group : 7 Item : 2)

Counts of Strobe Frames Setting

[Function] Sets number of frames.

[Form] <hexadecimal> 1B 07 01 07 02 Parameter CS

[Parameter]

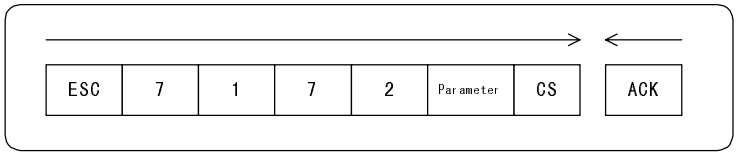
This parameter specifies the data to the number of frames.

Possible Data for Setting :

Frames 4 : 00

Frames 9 : 01

Frames 16 : 02



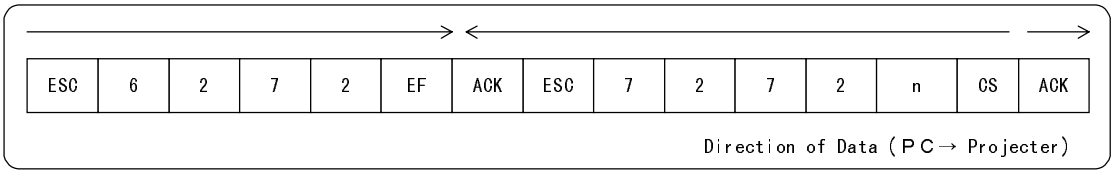
Get Counts of Strobe Frames

[Function] Gets the present number of frames.

[Form] <hexadecimal> 1B 06 02 07 02 EF

[Return Value]

Returns the present number of frames.



Initialize Counts of Strobe Frames

[Function] Initializes the number of frames.

[Form] <hexadecimal> 1B 06 03 07 02 EE

Counts of Strobe Time (Group : 7 Item : 3)

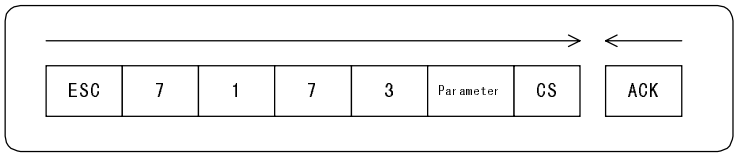
Counts of Strobe Time Setting

[Function] Sets numbers of strobe time.

[Form] <hexadecimal> 1B 07 01 07 03 Parameter CS

[Parameter]

This parameter specifies numbers of strobe time.



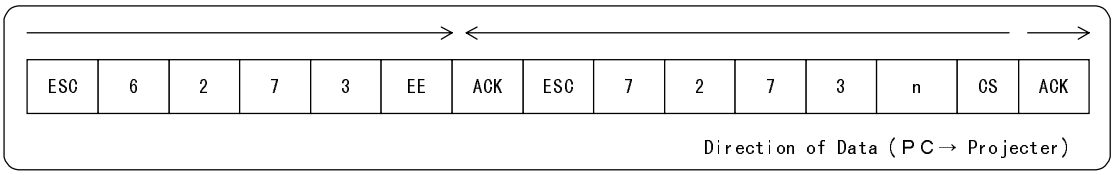
Get Counts of Strobe Time

[Function] Gets the present number of strobe time.

[Form] <hexadecimal> 1B 06 02 07 03 EE

[Return Value]

Returns the present number of strobe time.



Initialize Counts of Strobe Time

[Function] Initializes number of strobe time.

[Form] <hexadecimal> 1B 06 03 07 03 ED

3.9 Hardware Control

Controls hardware directly. Each function of the Hardware Control is as shown below.

Change operation mode to Circuit Adjustment mode to control hardware.

I 2 C (Group : 8 Item : 0)

Hardware Control from I 2 C bus

[Function] Controls hardware by I 2 C bus.

[Form] <hexadecimal> 1B Size 01 08 00 Parameter CS

[Parameter]

This parameter specifies the action of I 2 C bus.

When you want to set values for each device, refer the I 2 C bus communication system of the device and match the following I 2 C bus action.

I 2 C bus Action :

Start Requirement : 00

Stop Requirement : 0F

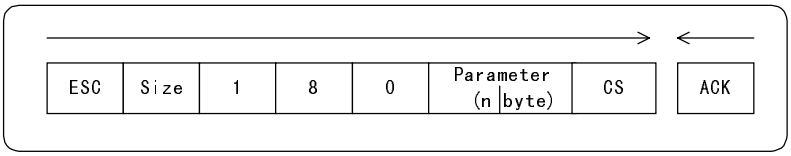
Write 1 byte : 03

Following 1byte after this is the write data.

Write Byte Specify : 05

Following 1byte after this is the specified byte number.

Data follows further is the write data.



Get State of Hardware from I 2 C Bus

[Function] Gets the state of hardware from I 2 C Bus.

[Form] <hexadecimal> 1B Size 02 08 00 Parameter CS

[Parameter]

This parameter specifies the action of I 2 C Bus.

When you want to get values from each device, refer the I 2 C bus communication system of the devices and match the following I 2 C bus action.

I 2 C Bus Action :

Start Requirement : 00

Stop Requirement : 0F

1 byte Read (response bit A CK) : 01

1 byte Read (response bit N A K) : 02

Specified byte Read : 04

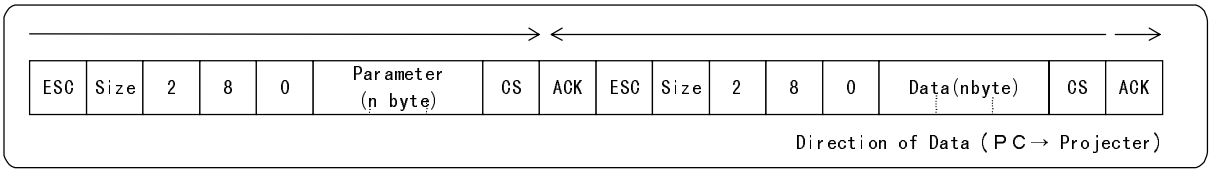
The 1byte follows after this is the specified byte number.

1 byte Write (Slave address, Data address etc.) : 03

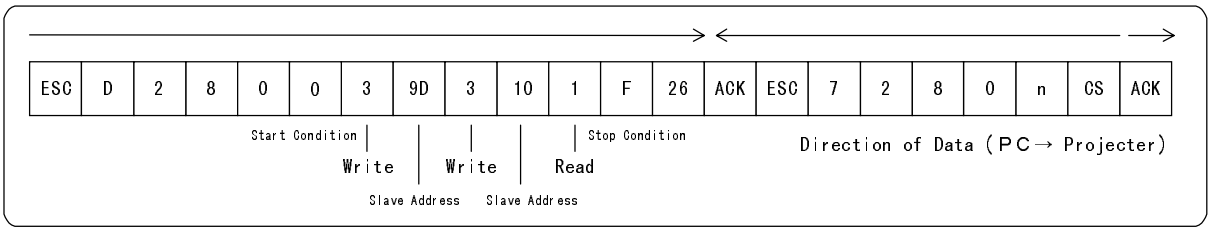
The 1byte follows after this is the write data.

[Return Value]

Returns data from I 2 C Bus.



(e.g.)



Memory (Group : 8 Item : 1)

Memory Data Setting

[Function] Writes memory data.

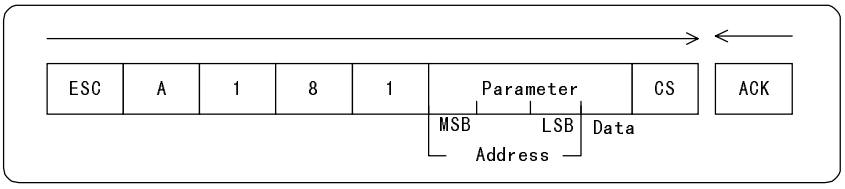
[Form] <hexadecimal> 1B 0A 01 08 01 Parameter CS

[Parameter]

This parameter specifies the addresses to write data and set data to memory.

Address : 3 byte

Set Data : 1 byte



Get Memory Data

[Function] Gets values of Memory.

[Form] <hexadecimal> 1B 09 02 08 01 Parameter CS

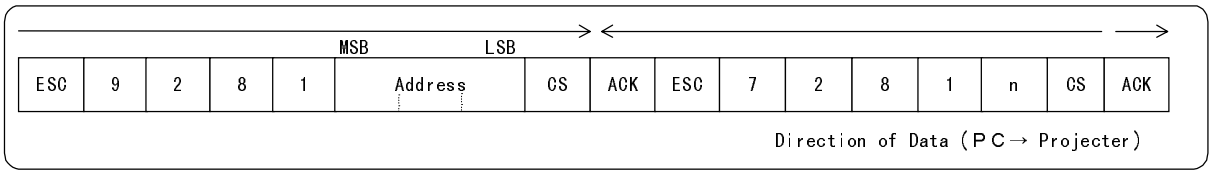
[Parameter]

This parameter specifies addresses.

Address : 3 byte

[Return Value]

Returns the data of specified address.



VS 2000 (Group : 8 Item : 2)

VS 2000 Data Setting

[Function] Controls VS2000. (Sets 1byte data to the register of VS2000.)

[Form] <hexadecimal> 1B 0B 01 08 02 Parameter CS

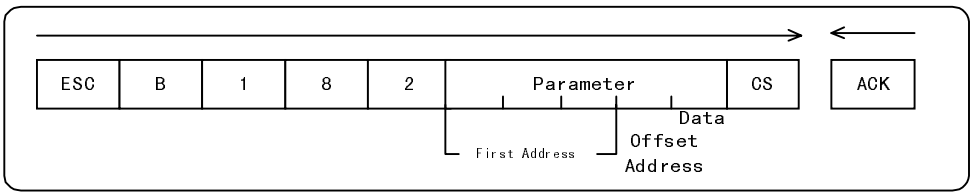
[Parameter]

This parameter specifies the first address, off-set address and set data of VS2000.

VS 2000 First Address : 3 byte

VS 2000 Off-set Address : 1 byte

VS 2000 Set Data : 1 byte



Get VS 2000 Data

[Function] Gets values of VS2000.

[Form] <hexadecimal> 1B 0A 02 08 02 Parameter CS

[Parameter]

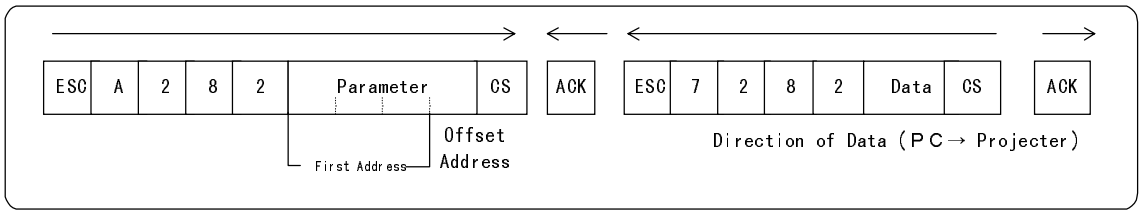
This parameter specifies the first address, off-set address and set data of VS2000.

VS 2000 First Address : 3 byte

VS 2000 Off-set Address : 1 byte

[Return Value]

Returns 1byte of the address data specified.



Gamma Data (Group : 8 Item : 3)

Sets gamma data directly from outside.

[Function] Sets gamma data and sends 33 gradation data for each RGB.

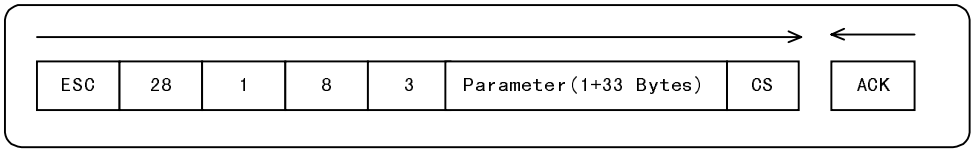
[Form] <hexadecimal> 1B 28 01 08 03 Parameter CS

[Parameter]

This parameter specifies RGB type and sets gamma data.

R G B Type : 1 byte (R : 00 G : 01 B : 02)

Gamma Data : 33 byte (No correction 0 to 32)



Get Gamma Data

[Function] Gets the gamma value (33 gradation) presently set.

[Form] <hexadecimal> 1B 07 02 08 03 Parameter CS

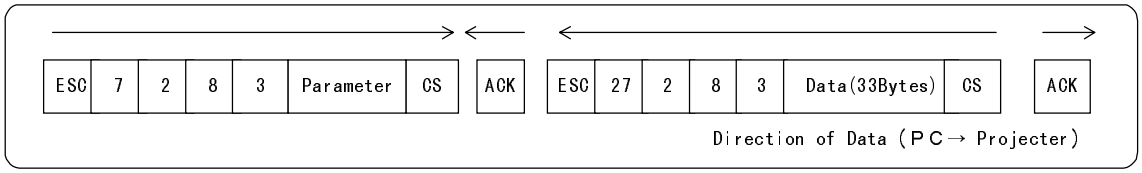
[Parameter]

This parameter specifies RGB type and sets gamma data.

R G B Type : 1 byte (R : 00 G : 01 B : 02)

[Return Value]

Returns gamma data (33 gradation) for specified type. (33 byte)



CPU A / D Register (Group : 8 Item : 4)

Get CPU A / D Register

[Function] Gets values of CPU A / D register data.

[Form] <hexadecimal> 1B 07 02 08 04 Parameter CS

[Parameter]

This parameter specifies A / D register.

L C P 1

A / D Register : (0 to 1) 1 byte

L C P 2

A / D Register : (0 to 2) 1 byte

Detecting Temp (L V side) : 0

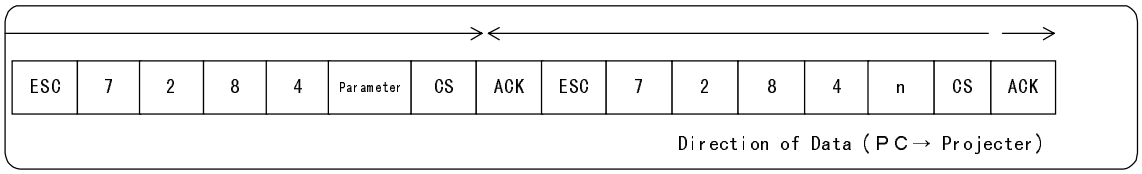
Detecting Temp (Lamp side) : 1

Detecting Temp (P B S side) : 2

[Return Value]

Returns register data specified by A / D.

Range of Return Value : <hexadecimal> 00 to FF



Key Codes (Group : 8 Item : 5)

Get Key Codes

[Function] Gets key codes of keys.

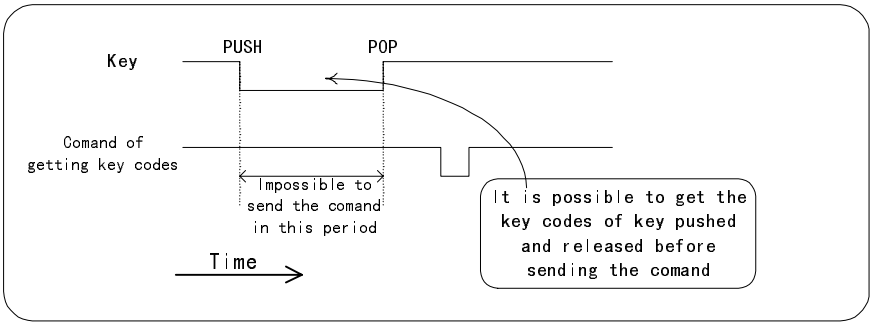
[Form] <hexadecimal> 1B 06 02 08 05 EB

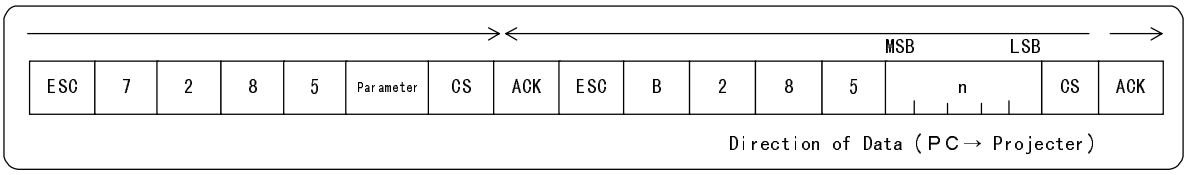
[Return Value]

Returns key codes have been pressed so far. Each key is represented by 1 bit, so if more than two keys are pressed at same time, it returns the sum of them.

Key Codes : (5 byte)

Standby	:	0000000001	Sync+	:	0000008000
Computer	:	0000000002	Sync-	:	0000010000
Video	:	0000000004	Tracking+	:	0000020000
Resize	:	0000000008	Tracking-	:	0000040000
Freeze	:	0000000010	Menu	:	0000080000
Blank	:	0000000020	Select+	:	0000100000
Auto	:	0000000040	Select-	:	0000200000
Mute	:	0000000080	Adjrst +	:	0000400000
Enter	:	0000000100	Select-	:	0000800000
Power	:	0000000200	Up	:	0001000000
Source	:	0000000400	Down	:	0002000000
Pause	:	0000000800	Left	:	0004000000
User	:	0000001000	Right	:	0008000000
Volume +	:	0000002000	Mouse Left Button	:	0010000000
Volume-	:	0000004000	Mouse Right Button	:	0020000000
			Custom	:	0040000000





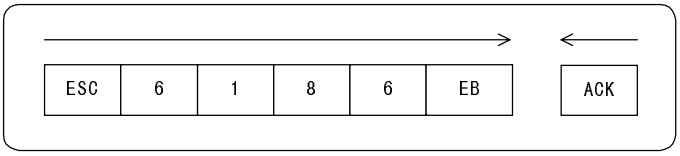
F R O M Checksum (Group : 8 Item : 6)

Making F R O M Checksum

[Function] Makes checksum of FROM presently contained.

[Form] <hexadecimal> 1B 06 01 08 06 CS

[Parameter] Non



(Note) Making the checksum takes 6 seconds. No commands are accepted during it.

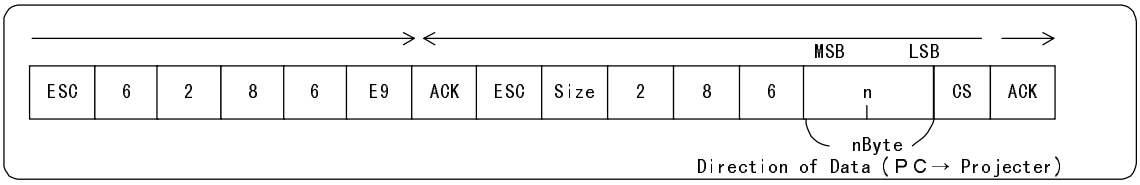
Get F R O M Checksum

[Function] Gets the checksum of FROM.

[Form] <hexadecimal> 1B 06 02 08 06 CS

[Return Value]

Returns the checksum of F R O M.



Mouse Movement (Group : 8 Item : 7)

Mouse Movement Setting

[Function] Permits or inhibits mouse movements.

[Form] <hexadecimal> 1B 07 01 08 07 Parameter CS

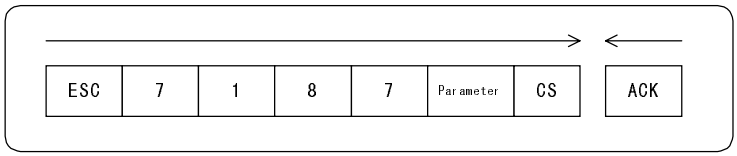
[Parameter]

This parameter specifies the data to Permit or Inhibit.

Possible Data for Setting :

Inhibit : 00

Permit : 01



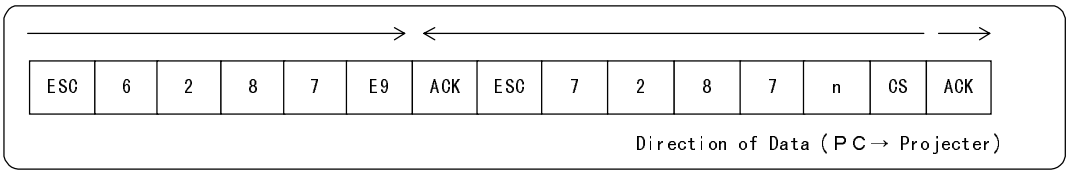
Get State of Mouse Movement

[Function] Gets the state of mouse movement.

[Form] <hexadecimal> 1B 06 02 08 07 E9

[Return Value]

Returns the state of mouse movement.



O S D Parameter (Group : 8 Item : 8)

O S D Parameter Setting

[Function] Sets parameters of OSD display. (When displaying OSD, first you need to preset the following settings related to the OSD display.)

[Form] <hexadecimal> 1B Size 01 08 08 Parameter CS

[Parameter]

(For EMP/ELP-3500)

This parameter sets the start coordinate for OSD display, line width, letter size, backcolor and flashing cycle.

Start X-coordinate : Register value at the horizontal start position of Display RAM on the OSD screen (2 byte)

Start Y -coordinate : Register value at the vertical start position of Display RAM on the OSD screen (2 byte)

Magnification : 1 byte

V magnification 1 / H magnification 1 = 0 V magnification 1 / H magnification 2 = 1

V magnification 2 / H magnification 1 = 2 V magnification 2 / H magnification 2 = 3

BackColor : 1 byte

BLACK = 0	YELLOW = 3	CYAN = 6
RED = 1	BLUE = 4	WHITE = 7
GREEN = 2	MAGENTA = 5	

BackColor of Inverted Characters : 1 byte

BLACK = 0	YELLOW = 3	CYAN = 6
RED = 1	BLUE = 4	WHITE = 7
GREEN = 2	MAGENTA = 5	

Flashing Cycle : 1 byte

No flash	= 0	Flashing Duty Rate23 % = 1
Flashing Duty Rate 50 %	= 2	Flashing Duty Rate 75 % = 3

All Luster Blanking : 1 byte (Display BackColor / Non-display)

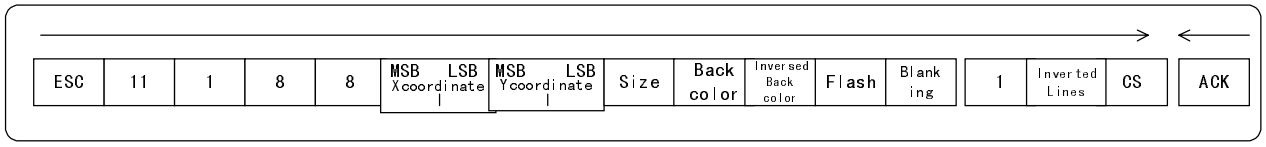
O N = 1

O F F = 0

Display Mode : 1 byte (Set 1)

Lines of Inverted Characters : 1 byte

Specifies lines for inverted characters from the first line to eighth line in the values from 0 bit to 7 bit. Sets 1 for the byte of inverted characters line.



(For EMP/ELP-5000, 5100, 7000, 7100)

The parameters sets the start coordinate for OSD display, line width, letter size, backcolor and flashing cycle.

Start X-coordinate : Start X-coordinate on the OSD screen
(Pixel Unit 60 to 775) 2 byte

Start Y-coordinate : Start Y-coordinate on the OSD screen
(Pixel Unit 0 to 581) 2 byte

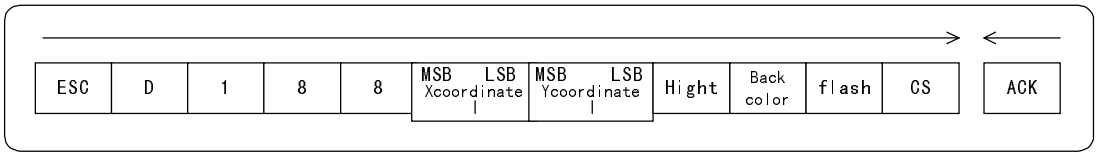
Height of Characters : Height of Characters (Pixel unit 18 to 63) 1 byte

OSD Backcolor : 1 byte

BLACK = 0	CYAN = 3	YELLOW = 6
BLUE = 1	RED = 4	WHITE = 7
GREEN = 2	MAGENTA = 5	No backcolor = 8

Flashing Cycle : 1 byte

No flash	: 0	1 / 1 Flash	: 1
1 / 1 Flash	: 2	3 / 1 Flash	: 3



O S D Character Data (Group : 8 Item : B)

O S D Character Data Setting

[Function] Sets characters to display OSD. (If displaying OSD, you first need to preset for OSD display in the OSD parameter settings.)

[Form] <hexadecimal> 1B Size 01 08 0B Parameter CS

[Parameter]

(For EMP/ELP-3500)

This parameter sets the display position on the OSD screen and number of characters in order of displaying character parameters and character codes repeatedly.

Display position on the OSD screen : 2 byte

[X-position : 1 byte]

Specify the start position to display with character's coordinates. Range : 0 to 23

[Y- position : 1 byte]

Specify the start position to display with character's coordinates. Range : 0 to 9

Character parameters : 1 byte

[Color of Character : 4 bit]

B L A C K : 0	B L U E : 4
R E D : 1	M A G E N T A : 5
G R E E N : 2	C Y A N : 6
Y E L L O W : 3	W H I T E : 7

[Flash / No Flash : 1 bit]

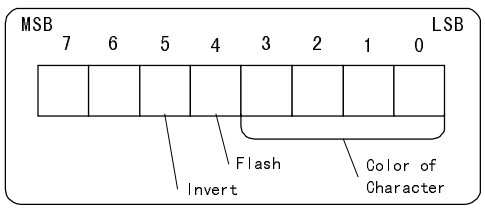
Flash : 1

No Flash : 0

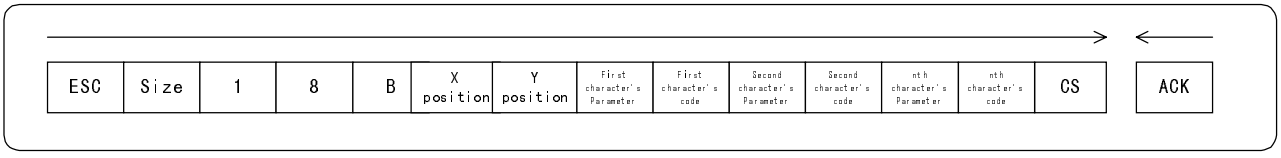
[Invert / No Invert : 1 bit]

Invert : 1

No Invert : 0



Character Code (MITSUBISHI M35042-XXXSP : Character font code) : 1 byte



(For EMP/ELP-5000, 5100, 7000, 7100)

The parameter sets the display position on the OSD screen and number of characters in order of displaying character parameters and character codes repeatedly.

Parameter :

Display position on the OSD screen : 2 byte

[X-position : 1 byte]

Specify the start position to display with character's coordinates. Range : 0 to 32

[Y-position : 1 byte]

Specify the start position to display with character's coordinates. Range : 0 to 13

Character Parameters : 1 byte

[Color of Character : 3 bit]

BLACK	: 0	RED	: 4
BLUE	: 1	MAGENTA	: 5
GREEN	: 2	YELLOW	: 6
CYAN	: 3	WHITE	: 7

[Flash / No Flash : 1 bit]

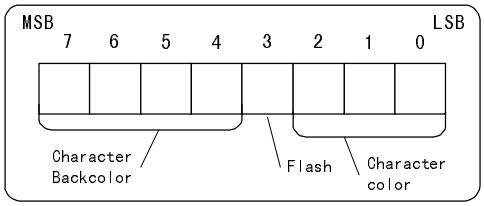
Flash : 1

No Flash : 0

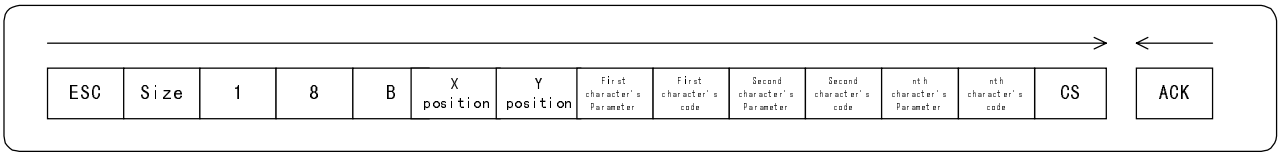
[BackColor of Character : 4 bit]

BLACK	: 0	RED	: 4
BLUE	: 1	MAGENTA	: 5
GREEN	: 2	YELLOW	: 6
CYAN	: 3	WHITE	: 7

No BackColor : 8



Character Code (THOMSON STV942X : Character Font Code) : 1 byte



No Gamma (Group : 8 Item : C)

No Gamma Setting

[Function] Controls digital gamma correction.

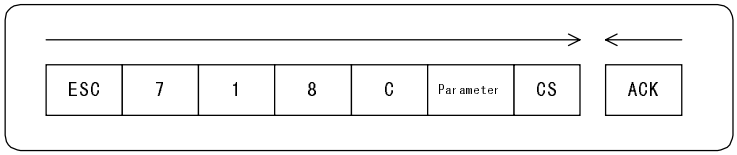
[Form] <hexadecimal> 1B 07 01 08 0C Parameter CS

[Parameter]

Possible Data for Setting :

No : 00

Yes : 01 (only EMP/ELP-5000, 5100, 7000 and 7100 are available)



Lamp O N / O F F (Group : 8 Item : D)

Lamp O N / O F F Setting

[Function] Sets lamp on or off.

[Form] <hexadecimal> 1B 07 01 08 0D Parameter CS

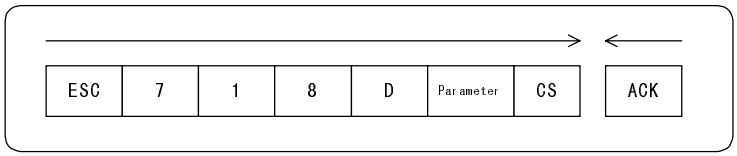
[Parameter]

This parameter specifies the data for ON or OFF.

Possible Data for Setting :

Power O N : 01

Power O F F : 00



Frame Memory (Group : 8 Item : E)

Get Frame Memory Data

[Function] Gets values of the frame memory.

[Form] <hexadecimal> 1B 02 08 0E Parameter CS

[Parameter]

This parameter specifies x-coordinate and y-coordinate to read out memory and access mode for memory.

X-coordinate : 2 byte

Y-coordinate : 2 byte

Access Mode : 1 byte

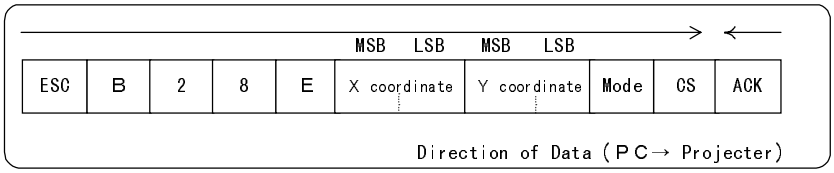
R G B 16 : 3

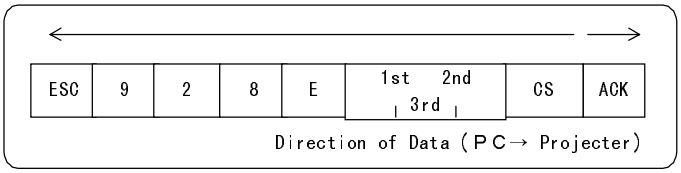
R G B 24 : 4

[Return Value]

Returns data 3byte of the address specified.

		1 s t	2 n d	3 r d
R G B 24	:	R7-0	G7-0	B7-0
R G B 16	:	R4-0, G5-3	G2-0, B4-0	Not set
		(MSB----LSB)	(MSB---LSB)	





Check of ＳＲＡＭ (Group : 8 Item : F)

Check of SRAM and Get the result data

[Function] Performs the SRAM check in specified mode and gets the result.

When the result is error, it returns the address of it.

[Form] <hexadecimal> 1B 0D 02 08 0F Parameter CS

[Parameter]

This parameter specifies the address to check and the check mode.

Address 1 : 3 byte (Specify with words unit.)

When checking to decode address codes : First address to check

When checking marching : First address to check

When checking to change program modes : Regular address

Address 2 : 3 byte (Specify with words unit.)

When checking to decode address codes : Last address to check

When checking marching : Last address to check

When checking to change program modes : Address at program mode

Test Mode : 1 byte

Checking to decode address : 0

Checking marching : 1

Checking to change program modes 2

[Return Value]

Checks specified address range in specified mode and returns the result.

When the result is error, it also returns the address value that error occurred.

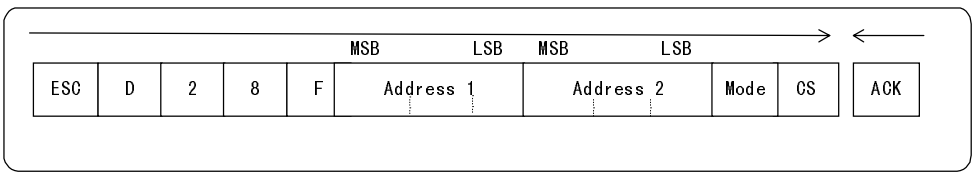
Result : 1 byte

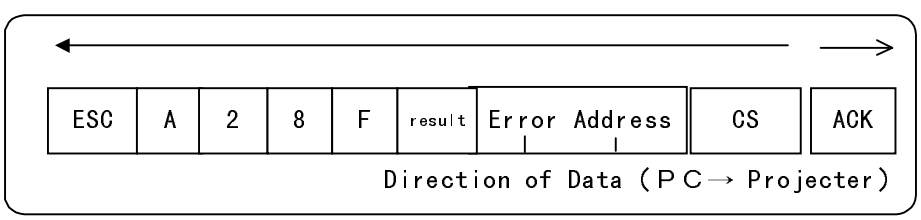
Normal End : 0

Error End : 1

Error Address : 3 byte

Error Address value (Not set with normal end.)





**** Note ****

*You must perform it while the projector is in standby mode.

*The marching check takes long time, so if the address range to test is huge, it is may be timed out.

*Since the contents of outer memory is destroyed, CPU is reset compulsorily after this command was implemented.

3.10 Flash ROM Control

Controls to rewrite the flash ROM (Download mode) and read into the contents (Upload mode) .

Each function for the flash ROM control is as shown below.

Delete Area (Group : 9 Item : 0)

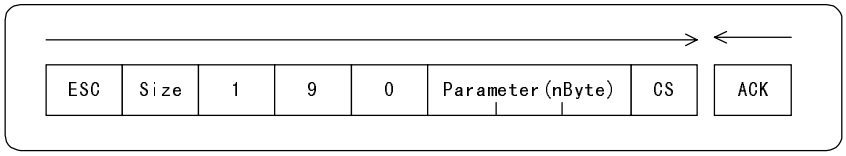
Delete Area

[Function] Deletes the area of Flash ROM to download. Use for rewriting Flash ROM from PC.

[Form] <hexadecimal> 1B Size 01 09 00 Parameter CS

[Parameter]

This parameter specifies the first address to delete the area of Flash ROM.



Response to Delete Area

[Function] Returns the response whether deleting area was operated correctly or not.

This command is used when rewrite Flash ROM from PC.

[Form] <hexadecimal> 1B 07 04 09 00 Parameter CS

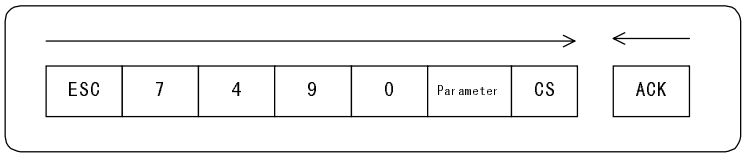
[Parameter]

This parameter specifies the value to indicate the result of Delete Area.

Possible Data to Specify :

Success : 00

Error : 01



Specifying Upload Area and Size (Group : 9 Item : 1)

Specifing Area

[Function] Specifies the area of Flash ROM to upload.

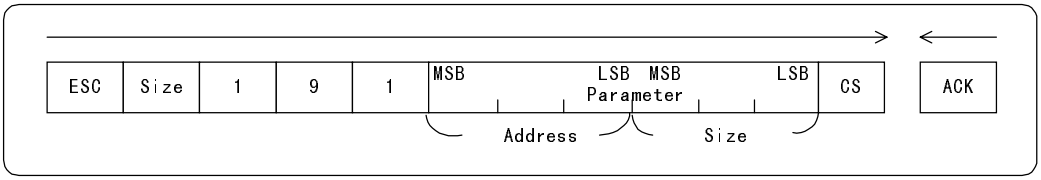
[Form] <hexadecimal> 1B 0C 01 09 01 Parameter CS

[Parameter]

This parameter specifies the first address and size to upload Flash ROM area.

Address (0 x 0 0 0 0 0 0 to 0 x F F F F F F) : 3 byte

Size (0 x 0 0 0 0 0 1 to 0 x F F F F F F) : 3 byte



F R O M Data (Group : 9 Item : 2)

F R O M Data

[Function] Indicates the form below for download and upload of Flash ROM.

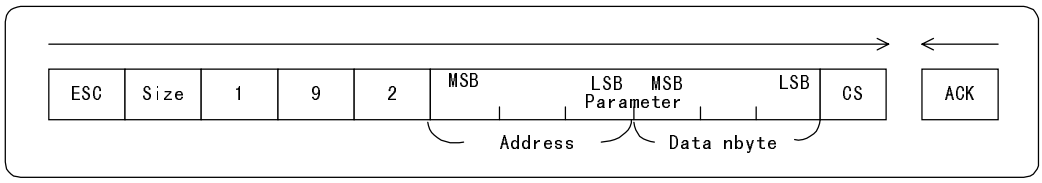
[Form] <hexadecimal> 1B Size 01 09 02 Parameter CS

[Parameter]

This parameter specifies the data address and data of Flash ROM.

Address (0 ax 0 0 0 0 0 0 to 0 x F F F F F F) : 3 byte

Data : N byte



Response for F R O M Data

[Function] Returns a response whether downloading was operated correctly or not.

This command is used when rewrite Flash ROM from PC.

[Form] <hexadecimal> 1B 07 04 09 02 Parameter CS

[Parameter]

This parameter specifies the value to indicate the result of Write ROM Data.

Possible Data to Specify :

Success : 00

Error : 01