



SERIAL COMMUNICATION LCD-DLP PROJECTOR

USERS MANUAL

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2. Communication basics

communication protocol

Communication protocol summary

Start byte	\xfe
Projector address	
Command byte(s)	
Data bytes <small>(OPTIONAL)</small>	
Checksum byte	
Stop byte	\xff

■ Start byte

The "start byte" informs the projector (in case of transmission) or the computer (in case of reception) that a new data transfer will take place.

■ Projector address :

The "projector address" defines the address of the projector the computer wants to talk to (in case of transmission) or the address of the projector that answers (in case of reception).

The maximum number of projectors that can be addressed by one computer is 256.

■ Command byte(s) :

There is at least one command byte to define the action to be performed. Commands that are not often used or complex commands can take more than one byte.

All command bytes that are sent by the computer to get information out of the projector are repeated in the answer-data-transfer of the projector.

■ Data bytes(OPTIONAL) :

Whether the command bytes are followed by one or more data bytes depends on the contents of the command bytes. (Some commands are not followed by data bytes at all !)

communication protocol

- Checksum byte :

The "checksum byte" is used to detect errors during transmission or reception.

Formula :

$$\begin{aligned} \text{Checksum byte} \\ = (\text{Projector address} + \text{Command bytes} + \text{Data bytes}) \text{ modulo } 256 \end{aligned}$$

- Stop byte :

The "stop byte" informs the projector (in case of transmission) or the computer (in case of reception) that the data transfer is complete and that the interpretation of the command and data bytes can start.

Any command byte, data byte or checksum byte that equals `\x80`, `\xfe` or `\xff` has to be converted !

Transmission :

- Instead of `\x80`, send `\x80 followed by \x00`.
- Instead of `\xfe`, send `\x80 followed by \x7e`.
- Instead of `\xff`, send `\x80 followed by \x7f`.

Reception :

- Replace `\x80 followed by \x00` with `\x80`.
- Replace `\x80 followed by \x7e` with `\xfe`.
- Replace `\x80 followed by \x7f` with `\xff`.

communication settings

Communication settings summary

Baud rate	see Owner's Manual
Data bits	8
Parity	no
Stop bits	1

■ Baud Rate :

Defines the speed of the data transfer.

The baud rate can be set, depending on the type of projector, using the dip switches on the processor board of the projector or using the menu structure.

Consult the Owner's Manual of the projector on how to change the baud rate setting !

■ Data Bits :

Eight data bits are used for each character of the data transfer.

■ Parity :

There is NO parity bit used to perform error checking.

■ Stop Bits :

One stop bit is used to define the end of a character.

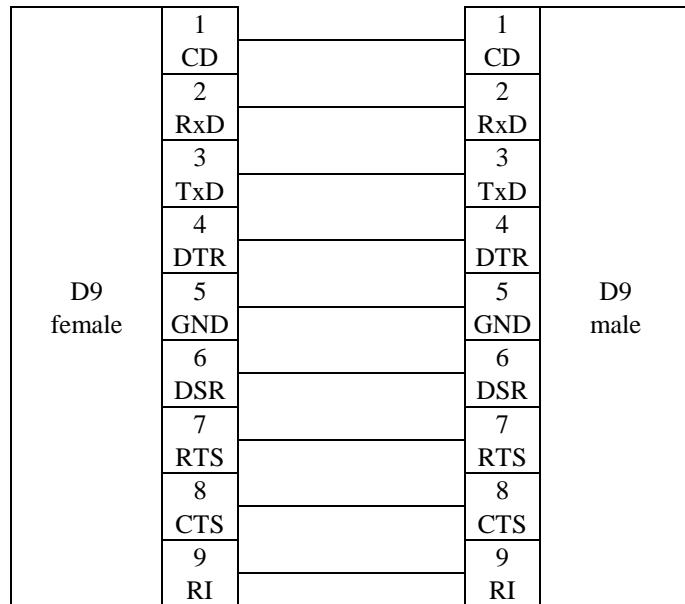
hardware

- Connector labelled "RS232 IN" :
This female D9-pin connector is used to connect the projector with the computer.
- Connector labelled "RS232 OUT" :
This male D9-pin connector is used to drive the next projector in a chain.
- Pin-out :
The pin-out is the 'standard' PC-AT convention, which is :

Pin #	Name	Full name
1	CD	Carrier Detect
2	RxD	Received Data
3	TxD	Transmitted Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

hardware

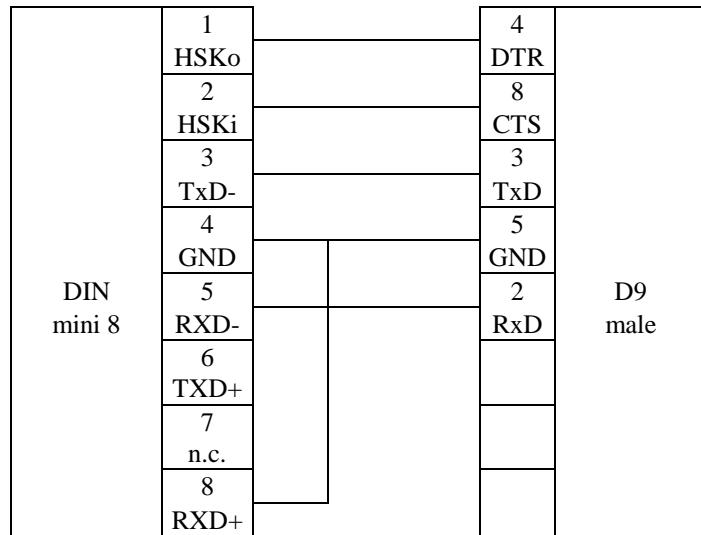
- Cable (IBM PC or compatible ⇔ projector) :



order number R9827560 (cable length = 15m)
order number R9827570 (cable length = 30m)

hardware

- Cable (MAC ⇔ projector) :



order number R9827640 (D9-DIN mini8; cable length = 1m)

order number R9827560 (D9-D9; cable length = 15m)

order number R9827570 (D9-D9; cable length = 30m)

- Signal levels :

State	Voltage
off = 1	-9V
on = 0	+9V

syntax

- Characters :

In this manual, all characters are expressed using the C-language syntax :

decimal values	<i>ddd</i>	<i>ddd</i> = 0..255
hexadecimal values	\x <i>hh</i>	<i>hh</i> = 00..ff

- Negative values/numbers :

The 2s complement number system is used to express negative numbers.

- Pascal-language string :

A Pascal-language string consists of one or more characters. The first character of the string contains the length of the string. Therefore, a Pascal-language string is limited to 255 characters.

Example : "hello world"

length	\x0b
'h'	\x68
'e'	\x65
'l'	\x6c
'l'	\x6c
'o'	\x6f
' '	\x20
'w'	\x77
'o'	\x6f
'r'	\x72
'l'	\x6c
'd'	\x64

■ C-language string :

A C-language string consists of one or more characters. The last character of the string is always the NULL (\x00) character. Therefore, the length of a C-language string is determined by the position of the NULL character.

Example : "hello world"

'h'	\x68
'e'	\x65
'l'	\x6c
'l'	\x6c
'o'	\x6f
' '	\x20
'w'	\x77
'o'	\x6f
'r'	\x72
'l'	\x6c
'd'	\x64
NULL	\x00

syntax

■ Filename

A filename is specified as a C-language string. This string has to follow some rules :

Filename												
0	1	2	3	4	5	6	7	8	9	10	11	12
x	x	x	x	x	x	x	x	.	y	z	z	NULL

- length string = 12
- x = character of the base name (= 8 characters)

'a'	'b'	'c'	'd'	'e'	'f'	'g'	'h'	'i'	'j'
'k'	'l'	'm'	'n'	'o'	'p'	'q'	'r'	's'	't'
'u'	'v'	'w'	'x'	'y'	'z'	'o'	'l'	'2'	'3'
'4'	'5'	'6'	'7'	'8'	'9'	'_'	'_'	''	''

- y = kind of file (= 1 character)

's'	standard file predefined file stored in read-only memory
'c'	custom file file created by the user and stored in non-volatile read-write memory

- z = file index (= 2 characters)

'0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	'8'	'9'
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

- zz specifies the location in memory where the file is stored

- for standard files : zz = 00..maximum standard files
- for custom files : zz = 00..63 where 00 is reserved for the file 'none .c00' (file loaded when no signal is applied).

- yzz is a unique combination. In other words, no two files can exist with the same extension yzz.

To specify more than one file you can use the question mark (?) wildcard character for x, y and z. This wildcard character can represent any possible character on that location.

Examples : "ntsc .c01", "svga_60v.s?7", "?????????.???"

abbreviations

- CLO
Constant Light Output.
- LCD
Liquid Crystal Display.
- LSB
Least Significant Byte.
In some exceptional cases : Least Significant Bit.
- MSB
Most Significant Byte.
In some exceptional cases : Most Significant Bit.
- OSD
On Screen Display.

3. Elementary commands

acknowledge – no acknowledge

- Description :

When the projector receives a command, the command format is checked (see communication protocol), including the projector address and the checksum. If the command format contains an error, the command is ignored.
If the command format is correct, the projector checks if the command is a valid command. If so, the projector answers with an acknowledge and starts executing the command. If not, the projector answers with a no acknowledge.

- Acknowledge command :

Command[0]	\x00
Command[1]	\x06

No acknowledge command :

Command[0]	\x00
Command[1]	\x15

- Example :

Acknowledge received of a projector with address \x01.

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

balance, decrement

- Description :

Decrement balance.

- Command :

Command[0]	\x23
Command[1]	\x0a

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Decrement balance of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x0a
Checksum	\x2e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

balance, increment

- Description :
Increment balance.
- Command :

Command[0]	\x22
Command[1]	\x0a

- Data :
No data bytes.
- Projector type :
All projectors with audio control.
- Example :
Increment balance of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x0a
Checksum	\x2d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

bass, decrement

- Description :

Decrement bass.

- Command :

Command[0]	\x23
Command[1]	\x08

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Decrement bass of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x08
Checksum	\x2c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

bass, increment

- Description :

Increment bass.

- Command :

Command[0]	\x22
Command[1]	\x08

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Increment bass of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x08
Checksum	\x2b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

brightness, decrement

- Description :
Decrement brightness.

- Command :

Command[0]	\x04
------------	------

- Data :
No data bytes.
- Projector type :
All projectors with audio control.
- Example :

Decrement the brightness of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x04
Checksum	\x05
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

brightness, increment

- Description :
Increment brightness.

- Command :

Command[0]	\x03
------------	------

- Data :
No data bytes.

- Example :

Increment the brightness of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x03
Checksum	\x04
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

color, decrement

■ Description :

Decrement color (saturation).

■ Command :

Command[0]	\x06
------------	------

■ Data :

No data bytes.

■ Example :

Decrement the color of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x06
Checksum	\x07
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

color, increment

- Description :

Increment color (saturation).

- Command :

Command[0]	\x05
------------	------

- Data :

No data bytes.

- Example :

Increment the color of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x05
Checksum	\x06
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

contrast, decrement

- Description :
Decrement contrast.

- Command :

Command[0]	\x02
------------	------

- Data :
No data bytes.
- Example :

Decrement contrast of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x02
Checksum	\x03
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

contrast, increment

- Description :
Increment contrast.

- Command :

Command[0]	\x01
------------	------

- Data :

No data bytes.

- Example :

Increment contrast of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x01
Checksum	\x02
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

infrared control

■ Description :

Simulation of the infrared remote control unit.

The codes act in the same way as if they were sent by an infrared remote control unit or the local keypad.

■ Command :

Command[0]	\x30
------------	------

■ Data :

Possible codes used for Data[0] :

Key	Data[0]
*	\x77
0	\x19
1	\x10
2	\x11
3	\x12
4	\x13
5	\x14
6	\x15
7	\x16
8	\x17
9	\x18
ADDR	\x20
ADJUST	\x09
ARROW DOWN	\x05
ARROW LEFT	\x07
ARROW RIGHT	\x06
ARROW UP	\x04
BALANCE+	\x3e
BALANCE-	\x3f

infrared control

BASS+	\x3a
BASS-	\x3b
BRIGHTNESS	\x27
BRIGHTNESS+	\x2a
BRIGHTNESS-	\x2b
COLOR	\x30
COLOR+	\x2c
COLOR-	\x2d
CONTRAST	\x25
CONTRAST+	\x28
CONTRAST-	\x29
ENTER	\x0a
EXIT	\x08
F1	\x6b
F2	\x6c
F3	\x6d
F4	\x6e
F5	\x6f
FREEZ	\x1b
HELP	\x1e
MUTE	\x1f
PAUSE	\x0f
PHASE	\x32
PHASE+	\x34
PHASE-	\x35
SHARPNESS	\x33
SHARPNESS+	\x36
SHARPNESS-	\x37
STDBY	\x0e
TEXT	\x0d

infrared control

TINT	\x31
TINT+	\x2e
TINT-	\x2f
TREBLE+	\x3c
TREBLE-	\x3d
VOLUME+	\x38
VOLUME-	\x39

Optional, a second data byte (Data[1]) can be sent.
If this byte is 1, the projector handles the key (Data[0]) as
it was sent using a remote control, taking all necessary
delays into account.
Note that this optional byte is not supported by all
projectors !

infrared control

■ Example :

Select source 3 of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x30
Data[0]	\x12
Checksum	\x43
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

mute audio, read

- Description :

Read the status of mute audio.

- Command :

Command[0]	\x21
Command[1]	\x3d

- Data :

No data bytes.

- Return data :

Data[0] = status mute audio.

Mute audio	Data[0]
Disabled	\x00
Enabled	\x01

- Projector type :

All projectors with audio control.

mute audio, read

■ Example :

Read the status of mute audio of a projector with address \x01. Suppose the audio is muted.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x3d
Checksum	\x5f
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x3d
Data[0]	\x01
Checksum	\x60
Stop	\xff

mute audio, write off

- Description :
Disable audio mute.
- Command :

Command[0]	\x26
Command[1]	\x3d

- Data :
No data bytes.
- Projector type :
All projectors with audio control.
- Example :
Disable audio mute of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x3d
Checksum	\x64
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

mute audio, write on

- Description :

Enable audio mute.

- Command :

Command[0]	\x27
Command[1]	\x3d

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Enable audio mute of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x3d
Checksum	\x65
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

mute video, read

- Description :
Read the status of mute video.
- Command :

Command[0]	\x21
Command[1]	\x3e

- Data :
No data bytes.
- Return data :
Data[0] = status mute video.

Mute audio	Data[0]
Disabled	\x00
Enabled	\x01

mute video, read

■ Example :

Read the status of mute video of a projector with address \x01. Suppose the video is muted.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x3e
Checksum	\x60
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x3e
Data[0]	\x01
Checksum	\x61
Stop	\xff

mute video, write off

■ Description :

Disable video mute.

■ Command :

Command[0]	\x26
Command[1]	\x3e

■ Data :

No data bytes.

■ Example :

Disable video mute of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x3e
Checksum	\x65
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

mute video, write on

■ Description :

Enable video mute.

The on-screen-display will be muted too !

■ Command :

Command[0]	\x27
Command[1]	\x3e

■ Data :

No data bytes.

■ Example :

Enable video mute of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x3e
Checksum	\x66
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

phase, decrement

- Description :
Decrement phase.

- Command :

Command[0]	\x0c
------------	------

- Data :

No data bytes.

- Example :

Decrement phase of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x0c
Checksum	\xd0
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

phase, increment

- Description :

Increment phase.

- Command :

Command[0]	\x0b
------------	------

- Data :

No data bytes.

- Example :

Increment phase of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x0b
Checksum	\x0c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

projector status, read

- Description :
Read the projector status.
- Command :

Command[0]	\x67
------------	------

- Data :
No data bytes.
- Return data :
The return data consists of one data byte containing the projector status. Only bit0 (least significant bit) to bit3/bit4* are significant.

bit#	bit = 0	bit = 1
bit0	projector is off	projector is on
bit1	text is off	text is on
bit2	video mute is off	video mute is on
bit3	picture is not frozen	picture is frozen
bit4*	no 800-peripheral connected	800-peripheral connected

* : bit 4 is not significant for BD5000,
BD8000 and BD8000LC.

projector status, read

■ Example :

Read the status of a projector with address \x01.

Suppose the status is projector on, text on, video mute off, picture frozen and no 800-peripheral connected.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x67
Checksum	\x68
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x67
Data[0]	\xb0
Checksum	\x73
Stop	\xff

projector status, write off

- Description :
Set the projector off.

- Command :

Command[0]	\x66
------------	------

- Data :
No data bytes.
- Example :

Set the projector with address \x01 off.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x66
Checksum	\x67
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

projector status, write on

- Description :
Set the projector on.

- Command :

Command[0]	\x65
------------	------

- Data :
No data bytes.
- Example :

Set the projector with address \x01 on.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x65
Checksum	\x66
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

sharpness, decrement

- Description :
Decrement sharpness.

- Command :

Command[0]	\x0a
------------	------

- Data :
No data bytes.
- Example :

Decrement sharpness of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x0a
Checksum	\x0b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

sharpness, increment

- Description :
Increment sharpness.

- Command :

Command[0]	\x09
------------	------

- Data :

No data bytes.

- Example :

Increment sharpness of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x09
Checksum	\xa0
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

source/slot, read number

- Description :
Read active source or slot.
- Command :

Command[0]	\x32
------------	------
- Data :
No data bytes.
- Return data :
Source or slot number (\x01..).

source/slot, read number

■ Example :

Read the active source/slot number of a projector with address \x01. Suppose the answer is \x03.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x32
Checksum	\x33
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x32
Data[0]	\x03
Checksum	\x36
Stop	\xff

source/slot, write number

- Description :
Select a source or slot.

- Command :

Command[0]	\x31
------------	------

- Data :
Source or slot number (\x01..).

source/slot, write number

- Example :

Select source 1 of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x31
Data[0]	\x01
Checksum	\x33
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

tint, decrement

- Description :
Decrement tint (hue).

- Command :

Command[0]	\x08
------------	------

- Data :
No data bytes.
- Example :

Decrement tint of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x08
Checksum	\x09
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

tint, increment

- Description :
Increment tint (hue).

- Command :

Command[0]	\x07
------------	------

- Data :

No data bytes.

- Example :

Increment tint of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x07
Checksum	\x08
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

treble, decrement

- Description :
Decrement treble.
- Command :

Command[0]	\x23
Command[1]	\x09

- Data :
No data bytes.
- Projector type :
All projectors with audio control.
- Example :
Decrement treble of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x09
Checksum	\x2d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

treble, increment

- Description :

Increment treble.

- Command :

Command[0]	\x22
Command[1]	\x09

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Increment treble of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x09
Checksum	\x2c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

volume, decrement

- Description :

Decrement volume.

- Command :

Command[0]	\x23
Command[1]	\x07

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Decrement volume of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x07
Checksum	\x2b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

volume, increment

- Description :

Increment volume.

- Command :

Command[0]	\x22
Command[1]	\x07

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Increment volume of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x07
Checksum	\x2a
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

4. Advanced commands

2 line LCD, read

■ Description :

Read data from the 2 line LCD. The data read contains :

- the status of the backlight
- all text
- the status and position of the cursor.

■ Command :

Command[0]	\x7a
Command[1]	\x01

■ Data :

No data bytes.

■ Return data :

The return data is a concatenation of the command bytes (except Command[0]), data and return data of following commands :

- "2 line LCD, read backlight"
- "2 line LCD, read text" (x=0, y=0)
- "2 line LCD, read text" (x=0, y=1)
- "2 line LCD, read cursor"

■ Note :

Command[1] of this command will not be found in the answer from the projector, because the answer is a concatenation of several commands.

■ Projector type :

All projectors equipped with a 2 line LCD.

2 line LCD, read

■ Example :

Read data from the 2 line LCD of a projector with address \x01. Suppose the backlight is on, top line (line 0) contains the text "hello world" and the cursor is off.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x01
Checksum	\x7c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

2 line LCD, read

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
"Backlight" Command[1]	\x04
"Backlight" Return data[0]	\x01
"Text" Command [1]	\x02
"Text" Data[0]	\x00
"Text" Data[1]	\x00
"Text" Return data[0]	\x68 (= 'h')
"Text" Return data[1]	\x65 (= 'e')
"Text" Return data[2]	\x6c (= 'l')
"Text" Return data[3]	\x6c (= 'l')
"Text" Return data[4]	\x6f (= 'o')
"Text" Return data[5]	\x20 (= ' ')
"Text" Return data[6]	\x77 (= 'w')
"Text" Return data[7]	\x6f (= 'o')
"Text" Return data[8]	\x72 (= 'r')
"Text" Return data[9]	\x6c (= 'l')
"Text" Return data[10]	\x64 (= 'd')
"Text" Return data[11]	\x00
"Cursor" Command[1]	\x03
"Cursor" Return data[0]	\x01
"Cursor" Return data[1]	\x01
"Cursor" Return data[2]	\x00
"Cursor" Return data[3]	\x00
Checksum	\xe3
Stop	\xff

2 line LCD, read backlight

- Description :

Read the status of the backlight of the 2 line LCD.

- Command :

Command[0]	\x7a
Command[1]	\x04

- Data :

No data bytes.

- Return data :

Data[0] = status.

Status	Data[0]
Off	\x00
On	\x01

- Projector type :

All projectors equipped with a 2 line LCD.

2 line LCD, read backlight

■ Example :

Read the status of the backlight of the 2 line LCD of a projector with address \x01. Suppose the backlight is on.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x04
Checksum	\x7f
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x04
Data[0]	\x01
Checksum	\x80
	\x00
Stop	\xff

2 line LCD, read cursor

- Description :

Read the status and position of the cursor of the 2 line LCD.

- Command :

Command[0]	\x7a
Command[1]	\x03

- Data :

No data bytes.

- Return data :

	Description
Data[0]	horizontal position (\x00..)
Data[1]	vertical position (\x00..)
Data[2]	Status
Data[3]	Blink

Status	Data[2]
Off	\x00
On	\x01

Blink	Data[3]
Off	\x00
On	\x01

- Projector type :

All projectors equipped with a 2 line LCD.

- Example :

2 line LCD, read cursor

Read the status and position of the cursor of the 2 line LCD of a projector with address \x01. Suppose the cursor is on, blinks and is positioned at location (4, 0).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x03
Checksum	\x7e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x03
Data[0]	\x04
Data[1]	\x00
Data[2]	\x01
Data[3]	\x01
Checksum	\x84
Stop	\xff

2 line LCD, read format

- Description :

Read the format (maximum number of characters and maximum number of lines) of the 2 line LCD.

- Command :

Command[0]	\x7a
Command[1]	\x06

- Data :

No data bytes.

- Return data :

	Description
Data[0]	number of characters
Data[1]	number of lines

- Projector type :

All projectors equipped with a 2 line LCD.

- Example :

Read the format of the 2 line LCD of a projector with address \x01. Suppose it's a 24 characters by 2 lines display.

2 line LCD, read format

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x06
Checksum	\x81
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x06
Data[0]	\x18
Data[1]	\x02
Checksum	\x9b
Stop	\xff

2 line LCD, read text

■ Description :

Read the text displayed on the 2 line LCD.

■ Command :

Command[0]	\x7a
Command[1]	\x02

■ Data :

Data[0]	horizontal position (\x00..)
Data[1]	vertical position (\x00..)
Data[2]	max number of characters

Note : Data[2] is optional

■ Return data :

Text as a C-language string.

■ Projector type :

All projectors equipped with a 2 line LCD.

■ Example :

Read the text displayed at position (0, 0) of the 2 line LCD of a projector with address \x01. Suppose the text is "hello world".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x02
Data[0]	\x00
Data[1]	\x00
Checksum	\x7d
Stop	\xff

2 line LCD, read text

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x02
Data[0]	\x00
Data[1]	\x00
Data[2]	\x68 (= 'h')
Data[3]	\x65 (= 'e')
Data[4]	\x6c (= 'l')
Data[5]	\x6c (= 'l')
Data[6]	\x6f (= 'o')
Data[7]	\x20 (= ' ')
Data[8]	\x77 (= 'w')
Data[9]	\x6f (= 'o')
Data[10]	\x72 (= 'r')
Data[11]	\x6c (= 'l')
Data[12]	\x64 (= 'd')
Data[13]	\x00
Checksum	\xd9
Stop	\xff

2 line LCD, write backlight

- Description :

Set the backlight on/off of the 2 line LCD.

- Command :

Command[0]	\x7a
Command[1]	\x84

- Data :

Data[0] = Status

Status	Data[0]
Off	\x00
On	\x01

- Note :

This command can be combined with other "2 lines LCD, write" commands.

- Projector type :

All projectors equipped with a 2 line LCD.

2 line LCD, write backlight

■ Example :

Set the backlight on of the 2 line LCD of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x84
Data[0]	\x01
Checksum	\x00
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

2 line LCD, write clear

- Description :

Clear all data displayed on the 2 line LCD.

- Command :

Command[0]	\x7a
Command[1]	\x85

- Data :

No data bytes.

- Note :

This command can be combined with other "2 lines LCD, write" commands.

- Projector type :

All projectors equipped with a 2 line LCD.

2 line LCD, write clear

■ Example :

Clear all data from the 2 line LCD of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x85
Checksum	\x00
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

2 line LCD, write cursor

- Description :

Set the cursor on or off at a certain position on the 2 line LCD. Only one cursor is available !

- Command :

Command[0]	\x7a
Command[1]	\x83

- Data :

	Description
Data[0]	horizontal position (\x00..)
Data[1]	vertical position (\x00..)
Data[2]	Status
Data[3]	Blink

Status	Data[2]
Off	\x00
On	\x01

Blink	Data[3]
Off	\x00
On	\x01

- Note :

If you write text AFTER writing the cursor, the cursor will be moved to the end of the written text !

- Note :

This command can be combined with other "2 lines LCD, write" commands.

2 line LCD, write cursor

- Projector type :
All projectors equipped with a 2 line LCD.
- Example :
Set a blinking cursor at position (4, 0) on the 2 line LCD
of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x83
Data[0]	\x04
Data[1]	\x00
Data[2]	\x01
Data[3]	\x01
Checksum	\x04
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

2 line LCD, write text

- Description :

Write text on the 2 line LCD.

- Command :

Command[0]	\x7a
Command[1]	\x82

- Data :

	Description
Data[0]	horizontal position (\x00..)
Data[1]	vertical position (\x00..)
Data[2..]]	C-Language string

- Note :

This command can be combined with other "2 lines LCD, write" commands.

- Projector type :

All projectors equipped with a 2 line LCD.

- Example :

Write the text "hello world" at position (0, 0) on the 2 line LCD of a projector with address \x01.

2 line LCD, write text

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x7a
Command[1]	\x82
Data[0]	\x00
Data[1]	\x00
Data[2]	\x68 (= 'h')
Data[3]	\x65 (= 'e')
Data[4]	\x6c (= 'l')
Data[5]	\x6c (= 'l')
Data[6]	\x6f (= 'o')
Data[7]	\x20 (= ' ')
Data[8]	\x77 (= 'w')
Data[9]	\x6f (= 'o')
Data[10]	\x72 (= 'r')
Data[11]	\x6c (= 'l')
Data[12]	\x64 (= 'd')
Data[13]	\x00
Checksum	\x59
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

800-peripheral, read output module

- Description :

Read the configuration of the 800-peripheral output module.

- Command :

Command[0]	\xf2
Command[1]	\x81

- Data :

No data bytes.

- Return data :

Data[0] = configuration.

Output module configuration	Data[0]
Standard	\x00
5 Cable	\x01

- Example :

Read the configuration of the 800-peripheral output module of a projector with address \x01. Suppose it indicates to be “Standard”.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf2
Command[1]	\x81
Checksum	\x74
Stop	\xff

800-peripheral, read output module

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xf2
Command[1]	\x81
Data[0]	\x00
Checksum	\x74
Stop	\xff

800-peripheral, write output module

■ Description :

Set-up the configuration of the 800-peripheral output module.

■ Command :

Command[0]	\xf2
Command[1]	\x01

■ Data :

Data[0] = configuration.

Output module configuration	Data[0]
Standard	\x00
5 Cable	\x01

■ Example :

Configure the 800-peripheral output module to be “Standard” of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf2
Command[1]	\x01
Data[0]	\x00
Checksum	\xf4
Stop	\xff

800-peripheral, write output module

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

balance, read

- Description :
Read the actual balance value.
- Command :

Command[0]	\x21
Command[1]	\x0a

- Data :
No data bytes.
- Return data :
Data[0] = balance value.
- Projector type :
All projectors with audio control.
- Example :
Read the actual balance value of a projector with address \x01. Suppose the balance equals \xeb (= -21).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x0a
Checksum	\x2c
Stop	\xff

balance, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\xa0
Data[0]	\xeb
Checksum	\x17
Stop	\xff

balance, write

- Description :
Write a new balance value.
- Command :

Command[0]	\x20
Command[1]	\x0a

- Data :
Data[0] = balance value.
- Projector type :
All projectors with audio control.
- Example :
Set the balance to \xeb (= -21) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x0a
Data[0]	\xeb
Checksum	\x16
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

bass, read

- Description :

Read the actual bass value.

- Command :

Command[0]	\x21
Command[1]	\x08

- Data :

No data bytes.

- Return data :

Data[0] = bass value.

- Projector type :

All projectors with audio control.

- Example :

Read the actual bass value of a projector with address \x01. Suppose the bass equals \x01 (= +1).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x08
Checksum	\x2a
Stop	\xff

bass, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x08
Data[0]	\x01
Checksum	\x2b
Stop	\xff

bass, write

■ Description :

Write a new bass value.

■ Command :

Command[0]	\x20
Command[1]	\x08

■ Data :

Data[0] = bass value.

■ Projector type :

All projectors with audio control.

■ Example :

Set the bass to \x01 (= +1) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x08
Data[0]	\x01
Checksum	\x2a
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

baudrate pc, write

- Description :

Change de pc baudrate.

- Command :

Command[0]	\x75
------------	------

- Data :

Data[]	c-language string
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- Notes :

- The acknowledge is sent at the same baudrate as the question. The baudrate will be changed after transmission of the acknowledge sequence.
- If the data contains a non-valid c-language string or an invalid baudrate, the baudrate will be set to 9600.

- Example :

Change the pc baudrate to 2400 baud of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x75
Data[0]	\x32 (= '2')
Data[1]	\x34 (= '4')
Data[2]	\x30 (= '0')
Data[3]	\x30 (= '0')
Data[4]	\x00
Checksum	\x3c
Stop	\xff

baudrate pc, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking bottom, decrement

- Description :
Decrement blanking bottom.
- Command :

Command[0]	\x23
Command[1]	\x4d

- Data :
No data bytes.
- Example :
Decrement blanking bottom of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x4d
Checksum	\x71
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking bottom, increment

- Description :
Increment blanking bottom.
- Command :

Command[0]	\x22
Command[1]	\x4d

- Data :
No data bytes.
- Example :
Increment blanking bottom of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x4d
Checksum	\x70
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking bottom, read

- Description :

Read the actual value of blanking bottom.

- Command :

Command[0]	\x21
Command[1]	\x4d

- Data :

No data bytes.

- Return data :

Data[0..1] = value of blanking bottom.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of blanking bottom of a projector with address \x01. Suppose the blanking bottom equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4d
Checksum	\x6f
Stop	\xff

blanking bottom, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4d
Data[0]	\x00
Data[1]	\x00
Checksum	\x6f
Stop	\xff

blanking bottom, write

- Description :

Write a new value for blanking bottom.

- Command :

Command[0]	\x20
Command[1]	\x4d

- Data :

Data[0..1] = value of blanking bottom.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the blanking bottom to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x4d
Data[0]	\x00
Data[1]	\x00
Checksum	\x6e
Stop	\xff

blanking bottom, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking left, decrement

- Description :
Decrement blanking left.
- Command :

Command[0]	\x23
Command[1]	\x4e

- Data :
No data bytes.
- Example :
Decrement blanking left of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x4e
Checksum	\x72
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking left, increment

- Description :

Increment blanking left.

- Command :

Command[0]	\x22
Command[1]	\x4e

- Data :

No data bytes.

- Example :

Increment blanking left of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x4e
Checksum	\x71
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking left, read

- Description :

Read the actual value of blanking left.

- Command :

Command[0]	\x21
Command[1]	\x4e

- Data :

No data bytes.

- Return data :

Data[0..1] = value of blanking left.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of blanking left of a projector with address \x01. Suppose the blanking left equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4e
Checksum	\x70
Stop	\xff

blanking left, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4e
Data[0]	\x00
Data[1]	\x00
Checksum	\x70
Stop	\xff

blanking left, write

- Description :

Write a new value for blanking left.

- Command :

Command[0]	\x20
Command[1]	\x4e

- Data :

Data[0..1] = value of blanking left.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the blanking left to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x4e
Data[0]	\x00
Data[1]	\x00
Checksum	\x6f
Stop	\xff

blanking left, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking right, decrement

- Description :
Decrement blanking right.
- Command :

Command[0]	\x23
Command[1]	\x4f

- Data :
No data bytes.
- Example :
Decrement blanking right of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x4f
Checksum	\x73
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking right, increment

- Description :
Increment blanking right.
- Command :

Command[0]	\x22
Command[1]	\x4f

- Data :
No data bytes.
- Example :
Increment blanking right of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x4f
Checksum	\x72
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking right, read

- Description :

Read the actual value of blanking right.

- Command :

Command[0]	\x21
Command[1]	\x4f

- Data :

No data bytes.

- Return data :

Data[0..1] = value of blanking right.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of blanking right of a projector with address \x01. Suppose the blanking right equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4f
Checksum	\x71
Stop	\xff

blanking right, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4f
Data[0]	\x00
Data[1]	\x00
Checksum	\x71
Stop	\xff

blanking right, write

- Description :

Write a new value for blanking right.

- Command :

Command[0]	\x20
Command[1]	\x4f

- Data :

Data[0..1] = value of blanking right.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the blanking right to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x4f
Data[0]	\x00
Data[1]	\x00
Checksum	\x70
Stop	\xff

blanking right, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking top, decrement

- Description :
Decrement blanking top.
- Command :

Command[0]	\x23
Command[1]	\x4c

- Data :
No data bytes.
- Example :
Decrement blanking top of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x4c
Checksum	\x70
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking top, increment

■ Description :

Increment blanking top.

■ Command :

Command[0]	\x22
Command[1]	\x4c

■ Data :

No data bytes.

■ Example :

Increment blanking top of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x4c
Checksum	\x6f
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

blanking top, read

- Description :

Read the actual value of blanking top.

- Command :

Command[0]	\x21
Command[1]	\x4c

- Data :

No data bytes.

- Return data :

Data[0..1] = value of blanking top.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of blanking top of a projector with address \x01. Suppose the blanking top equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4c
Checksum	\x6e
Stop	\xff

blanking top, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4c
Data[0]	\x00
Data[1]	\x00
Checksum	\x6e
Stop	\xff

blanking top, write

- Description :

Write a new value for blanking top.

- Command :

Command[0]	\x20
Command[1]	\x4c

- Data :

Data[0..1] = value of blanking top.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the blanking top to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x4c
Data[0]	\x00
Data[1]	\x00
Checksum	\x6d
Stop	\xff

blanking top, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

brightness, read

- Description :
Read the actual brightness value.
- Command :

Command[0]	\x21
Command[1]	\x02

- Data :
No data bytes.
- Return data :
Data[0] = brightness value.
- Example :
Read the actual brightness value of a projector with address \x01. Suppose the brightness equals \x20.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x02
Checksum	\x24
Stop	\xff

brightness, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x02
Data[0]	\x20
Checksum	\x44
Stop	\xff

brightness, write

- Description :
Write a new brightness value.
- Command :

Command[0]	\x20
Command[1]	\x02

- Data :
Data[0] = brightness value.
- Example :
Set the brightness to \x20 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x02
Data[0]	\x20
Checksum	\x43
Stop	\xff

brightness, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp delay, decrement

- Description :
Decrement the clamp delay.
- Command :

Command[0]	\x23
Command[1]	\x67

- Data :
No data bytes.
- Example :
Decrement the clamp delay of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x67
Checksum	\x8b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp delay, increment

■ Description :

Increment the clamp delay.

■ Command :

Command[0]	\x22
Command[1]	\x67

■ Data :

No data bytes.

■ Example :

Increment the clamp delay of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x67
Checksum	\x8a
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp delay, read

- Description :

Read the actual value of the clamp delay.

- Command :

Command[0]	\x21
Command[1]	\x67

- Data :

No data bytes.

- Return data :

Data[0] = value of the clamp delay.

- Example :

Read the actual value of the clamp delay of a projector with address \x01. Suppose the clamp delay equals \x00.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x67
Checksum	\x89
Stop	\xff

clamp delay, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x67
Data[0]	\x00
Checksum	\x89
Stop	\xff

clamp delay, write

■ Description :

Write a new value for the clamp delay.

■ Command :

Command[0]	\x20
Command[1]	\x67

■ Data :

Data[0] = value of the clamp delay.

■ Example :

Set the clamp delay to \x00 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x67
Data[0]	\x00
Checksum	\x88
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp edge, read

■ Description :

Read the actual value of the clamp edge.

■ Command :

Command[0]	\x21
Command[1]	\x66

■ Data :

No data bytes.

■ Return data :

Data[0] = value of the clamp edge.

	Data[0]
Leading	\x00
Trailing	\x01

■ Example :

Read the actual value of the clamp edge of a projector with address \x01. Suppose the clamp edge is leading.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x66
Checksum	\x88
Stop	\xff

clamp edge, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x66
Data[0]	\x00
Checksum	\x88
Stop	\xff

clamp edge, write leading

- Description :
Set the clamp edge to leading.
- Command :

Command[0]	\x26
Command[1]	\x66

- Data :
No data bytes.
- Example :
Set the clamp edge to leading on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x66
Checksum	\x8d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp edge, write trailing

- Description :
Set the clamp edge to trailing.
- Command :

Command[0]	\x27
Command[1]	\x66

- Data :
No data bytes.
- Example :
Set the clamp edge to trailing on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x66
Checksum	\x8e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp width, decrement

- Description :
Decrement the clamp width.
- Command :

Command[0]	\x23
Command[1]	\x68

- Data :
No data bytes.
- Example :
Decrement the clamp width of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x68
Checksum	\x8c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp width, increment

- Description :
Increment the clamp width.
- Command :

Command[0]	\x22
Command[1]	\x68

- Data :
No data bytes.
- Example :
Increment the clamp width of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x68
Checksum	\x8b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

clamp width, read

- Description :

Read the actual value of the clamp width.

- Command :

Command[0]	\x21
Command[1]	\x68

- Data :

No data bytes.

- Return data :

Data[0] = value of the clamp width.

- Example :

Read the actual value of the clamp width of a projector with address \x01. Suppose the clamp width equals \x32.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x68
Checksum	\x8a
Stop	\xff

clamp width, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x68
Data[0]	\x32
Checksum	\xbc
Stop	\xff

clamp width, write

■ Description :

Write a new value for the clamp width.

■ Command :

Command[0]	\x20
Command[1]	\x68

■ Data :

Data[0] = value of the clamp width.

■ Example :

Set the clamp width to \x32 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x68
Data[0]	\x32
Checksum	\xbb
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

color, read

- Description :

Read the actual color (saturation) value.

- Command :

Command[0]	\x21
Command[1]	\x03

- Data :

No data bytes.

- Return data :

Data[0] = color value.

- Example :

Read the actual color value of a projector with address \x01. Suppose the color equals \x20.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x03
Checksum	\x25
Stop	\xff

color, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x03
Data[0]	\x20
Checksum	\x45
Stop	\xff

color, write

■ Description :

Write a new color (saturation) value.

■ Command :

Command[0]	\x20
Command[1]	\x03

■ Data :

Data[0] = color value.

■ Example :

Set the color to \x20 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x03
Data[0]	\x20
Checksum	\x44
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

color balance, decrement

- Description :
Decrement the actual color balance.
- Command (color balance red/green) :

Command[0]	\x23
Command[1]	\x43

Command (color balance blue/green) :

Command[0]	\x23
Command[1]	\x44

- Data :
No data bytes.
- Example :
Decrement the color balance red/green on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x43
Checksum	\x67
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

color balance, increment

- Description :
Increment the actual color balance.
- Command (color balance red/green) :

Command[0]	\x22
Command[1]	\x43

Command (color balance blue/green) :

Command[0]	\x22
Command[1]	\x44

- Data :
No data bytes.
- Example :

Increment the color balance red/green on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x43
Checksum	\x66
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

color balance, read

- Description :
Read the color balance.
- Command (color balance red/green) :

Command[0]	\x21
Command[1]	\x43

Command (color balance blue/green) :

Command[0]	\x21
Command[1]	\x44

- Data (only in case of reading the color balance of a specified color temperature) :

Data[0] = color temperature.

Data[0]	
0	"PROJECTOR WHITE"
1	custom color balance derived from "PROJECTOR WHITE"
2	custom color balance derived from 3200, 5400, 6500 or 9300
32	3200
54	5400
65	6500
93	9300

color balance, read

- Return data :

Data[0] = value of color balance multiplied by 100.

Data[0]	\x00..\xfa
Example : Data[0]=\x64 equals 1.00	

color balance, read

■ Example :

Read the color balance red/green of a projector with address \x01. Suppose the color balance equals 1.00.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x43
Checksum	\x65
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x43
Data[0]	\x64
Checksum	\xc9
Stop	\xff

color balance, write

- Description :

Write the actual color balance.

- Command (color balance red/green) :

Command[0]	\x20
Command[1]	\x43

Command (color balance blue/green) :

Command[0]	\x20
Command[1]	\x44

- Data :

Data[0] = value of color balance multiplied by 100.

Data[0]	\x00..\xfa
Example : Data[0]=\x64 equals 1.00	

- Example :

Set the color balance red/green to 1.00 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x43
Data[0]	\x64
Checksum	\xc8
Stop	\xff

color balance, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

color temperature, read

- Description :
Read the actual color temperature.
- Command (color balance red/green) :

Command[0]	\x21
Command[1]	\x45

- Data :
No data bytes.
- Return data :
Data[0] = color temperature.

Data[0]	
0	"PROJECTOR WHITE"
1	custom color balance derived from "PROJECTOR WHITE"
2	custom color balance derived from 3200, 5400, 6500 or 9300
32	3200
54	5400
65	6500
93	9300

color temperature, read

■ Example :

Read the actual color temperature of a projector with address \x01. Suppose the color temperature equals 6500.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x45
Checksum	\x67
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x45
Data[0]	\x41
Checksum	\xa8
Stop	\xff

color temperature, write

- Description :
Write the color temperature.
- Command :

Command[0]	\x20
Command[1]	\x45

- Data :
Data[0] = color temperature.

Data[0]	
0	"PROJECTOR WHITE"
1	custom color balance derived from "PROJECTOR WHITE"
2	custom color balance derived from 3200, 5400, 6500 or 9300
32	3200
54	5400
65	6500
93	9300

color temperature, write

■ Example :

Set the color temperature to 6500 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x45
Data[0]	\x41
Checksum	\xa7
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

contrast, read

- Description :

Read the actual contrast value.

- Command :

Command[0]	\x21
Command[1]	\x01

- Data :

No data bytes.

- Return data :

Data[0] = contrast value.

- Example :

Read the actual contrast value of a projector with address \x01. Suppose the contrast equals \x30.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x01
Checksum	\x23
Stop	\xff

contrast, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x01
Data[0]	\x30
Checksum	\x53
Stop	\xff

contrast, write

- Description :
Write a new contrast value.
- Command :

Command[0]	\x20
Command[1]	\x01

- Data :
Data[0] = contrast value.
- Example :
Set the contrast to \x30 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x01
Data[0]	\x30
Checksum	\x52
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

dimming, decrement

- Description :
Decrement dimming.
- Command :

Command[0]	\x23
Command[1]	\x0d

- Data :
No data bytes.
- Projector type :
Please verify the Owner's Manual of the projector if the dimming feature is supported.
- Example :
Decrement dimming of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x0d
Checksum	\x31
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

dimming, increment

- Description :

Increment dimming.

- Command :

Command[0]	\x22
Command[1]	\x0d

- Data :

No data bytes.

- Projector type :

Please verify the Owner's Manual of the projector if the dimming feature is supported.

- Example :

Increment dimming of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x0d
Checksum	\x30
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

dimming, read

- Description :
Read the dimming value.
- Command :

Command[0]	\x21
Command[1]	\x0d

- Data :
No data bytes.
- Return data :
Data[0] = dimming value.
- Projector type :
Please verify the Owner's Manual of the projector if the dimming feature is supported.
- Example :
Read the dimming value of a projector with address \x01.
Suppose the dimming equals \x07.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x0d
Checksum	\x2f
Stop	\xff

dimming, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x0d
Data[0]	\x07
Checksum	\x36
Stop	\xff

fade audio, decrement

- Description :

Decrement the fade value. The audio volume level of the external speaker(s) will decrease or the audio volume of the internal speaker(s) will increase.

- Command :

Command[0]	\x23
Command[1]	\x5f

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Decrement the fade value of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x5f
Checksum	\x83
Stop	\xff

fade audio, decrement

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio, increment

- Description :

Increment the fade value. The audio volume level of the external speaker(s) will increase or the audio volume of the internal speaker(s) will decrease.

- Command :

Command[0]	\x22
Command[1]	\x5f

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Increment the fade value of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x5f
Checksum	\x82
Stop	\xff

fade audio, increment

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio, read

- Description :

Read the actual fade value.

- Command :

Command[0]	\x21
Command[1]	\x5f

- Data :

No data bytes.

- Return data :

Data[0] = fade value.

- Projector type :

All projectors with audio control.

- Example :

Read the actual fade value of a projector with address \x01. Suppose the value equals -15 (\xf1).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5f
Checksum	\x81
Stop	\xff

fade audio, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5f
Data[0]	\xf1
Checksum	\x72
Stop	\xff

fade audio, write

■ Description :

Write a new fade value.

■ Command :

Command[0]	\x20
Command[1]	\x5f

■ Data :

Data[0] = fade value.

■ Projector type :

All projectors with audio control.

■ Example :

Set the fade value to -15 (\xf1) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x5f
Data[0]	\xf1
Checksum	\x71
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio extern, decrement

- Description :

Decrement the fade value of the external speaker(s). The audio volume level of the external speaker(s) will decrease.

- Command :

Command[0]	\x23
Command[1]	\x41

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Decrement the fade value of the external speaker(s) of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x41
Checksum	\x65
Stop	\xff

fade audio extern, decrement

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio extern, increment

- Description :

Increment the fade value of the external speaker(s). The audio volume level of the external speaker(s) will increase.

- Command :

Command[0]	\x22
Command[1]	\x41

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Increment the fade value of the external speaker of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x41
Checksum	\x64
Stop	\xff

fade audio extern, increment

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio extern, read

■ Description :

Read the actual fade value of the external speaker(s).

■ Command :

Command[0]	\x21
Command[1]	\x41

■ Data :

No data bytes.

■ Return data :

Data[0] = fade value.

■ Projector type :

All projectors with audio control.

■ Example :

Read the actual fade value of the external speaker(s) of a projector with address \x01. Suppose the value equals 15.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x41
Checksum	\x63
Stop	\xff

fade audio extern, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x41
Data[0]	\x0f
Checksum	\x72
Stop	\xff

fade audio extern, write

■ Description :

Write a new fade value for the extern speaker(s).

■ Command :

Command[0]	\x20
Command[1]	\x41

■ Data :

Data[0] = fade value.

■ Projector type :

All projectors with audio control.

■ Example :

Set the fade value for the external speaker(s) to \x0f on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x41
Data[0]	\x0f
Checksum	\x71
Stop	\xff

fade audio extern, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio intern, decrement

- Description :

Decrement the fade value of the internal speaker. The audio volume level of the internal speaker will decrease.

- Command :

Command[0]	\x23
Command[1]	\x40

- Data :

No data bytes.

- Projector type :

All projectors with audio control.

- Example :

Decrement the fade value of the internal speaker of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x40
Checksum	\x64
Stop	\xff

fade audio intern, decrement

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio intern, increment

- Description :

Increment the fade value of the internal speaker. The audio volume level of the internal speaker will increase.

- Command :

Command[0]	\x22
Command[1]	\x40

- Data :

No data bytes.

- Example :

Increment the fade value of the internal speaker of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x40
Checksum	\x63
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

fade audio intern, read

■ Description :

Read the actual fade value of the internal speaker.

■ Command :

Command[0]	\x21
Command[1]	\x40

■ Data :

No data bytes.

■ Return data :

Data[0] = fade value.

■ Projector type :

All projectors with audio control.

■ Example :

Read the actual fade value of the internal speaker of a projector with address \x01. Suppose the value equals 15.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x40
Checksum	\x62
Stop	\xff

fade audio intern, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x40
Data[0]	\x0f
Checksum	\x71
Stop	\xff

fade audio intern, write

■ Description :

Write a new fade value for the intern speaker.

■ Command :

Command[0]	\x20
Command[1]	\x40

■ Data :

Data[0] = fade value.

■ Projector type :

All projectors with audio control.

■ Example :

Set the fade value for the internal speaker to \x0f on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x40
Data[0]	\x0f
Checksum	\x70
Stop	\xff

fade audio intern, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

field polarity, read

- Description :

Read the actual position of field polarity.

- Command :

Command[0]	\x21
Command[1]	\x62

- Data :

No data bytes.

- Return data :

Data[0] = field polarity.

	Data[0]
Negative	\x00
Positive	\x01
Automatic	\x02

- Example :

Read the actual field polarity of a projector with address \x01. Suppose there is automatic installation of the field polarity.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x62
Checksum	\x84
Stop	\xff

field polarity, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x62
Data[0]	\x02
Checksum	\x86
Stop	\xff

field polarity, write

- Description :
Change the field polarity value.
- Command :

Command[0]	\x20
Command[1]	\x62

- Data :
Data[0] = field polarity.

	Data[0]
Negative	\x00
Positive	\x01
Automatic	\x02

- Example :
Set the field polarity to automatic on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x62
Data[0]	\x02
Checksum	\x85
Stop	\xff

field polarity, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

field select, read

- Description :
Read what field is actually selected.
- Command :

Command[0]	\x21
Command[1]	\x63

- Data :
No data bytes.
- Return data :
Data[0] = selected field.

	Data[0]
Even	\x00
Odd	\x01
Both	\x02

- Example :
Read the actual selected field of a projector with address \x01. Suppose both fields are displayed.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x63
Checksum	\x85
Stop	\xff

field select, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x63
Data[0]	\x02
Checksum	\x87
Stop	\xff

field select, write

■ Description :

Change the field selection.
(Only in case of interlaced images.)

■ Command :

Command[0]	\x20
Command[1]	\x63

■ Data :

Data[0] = field selection.

	Data[0]
Even	\x00
Odd	\x01
Both	\x02

■ Example :

Select both fields on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x63
Data[0]	\x02
Checksum	\x86
Stop	\xff

field select, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, copy

■ Description :

Copy file1 to file2.

- File2 (destination file) has to be a custom file.
- If the location specified by the "file index" of file2 has already been taken up, file2 will overwrite that contents.
- If file1 and file2 point to the same location, the base name of file1 is replaced by the base name of file2 without affecting other data.

■ Command :

Command[0]	\xc2
------------	------

■ Data :

From filename followed by the to filename (no wildcards allowed).

■ Example :

Copy the file "ntsc .c01" to "camera1 .c05" on a projector with address \x01.

file, copy

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xc2
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x31 (= '1')
Data[12]	\x00
Data[13]	\x63 (= 'c')
Data[14]	\x61 (= 'a')
Data[15]	\x6d (= 'm')
Data[16]	\x65 (= 'e')
Data[17]	\x72 (= 'r')
Data[18]	\x61 (= 'a')
Data[19]	\x31 (= '1')
Data[20]	\x20 (= ' ')
Data[21]	\x2e (= ':')
Data[22]	\x63 (= 'c')
Data[23]	\x30 (= '0')
Data[24]	\x35 (= '5')
Data[25]	\x00
Checksum	\x9d
Stop	\xff

file, copy

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, delete

■ Description :

Delete one or more files.

- Only custom files (?????????.c??) can be deleted.

■ Command :

Command[0]	\xc1
------------	------

■ Data :

One or more filenames (wildcards allowed).

■ Example :

Delete all files starting with the characters "nt" on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xc1
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x3f (= '?')
Data[3]	\x3f (= '?')
Data[4]	\x3f (= '?')
Data[5]	\x3f (= '?')
Data[6]	\x3f (= '?')
Data[7]	\x3f (= '?')
Data[8]	\x2e (= ':')
Data[9]	\x3f (= '?')
Data[10]	\x3f (= '?')
Data[11]	\x3f (= '?')
Data[12]	\x00
Checksum	\x09
Stop	\xff

file, delete

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, list

■ Description :

Get a list of files.

■ Command :

Command[0]	\xc0
------------	------

■ Data :

One or more filenames (wildcards allowed).

■ Example :

Get a list of all files starting with the characters "nt" on a projector with address \x01. Suppose there are 2 files : "ntsc .s02" and "ntsc_rgb.c01".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xc0
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x3f (= '?')
Data[3]	\x3f (= '?')
Data[4]	\x3f (= '?')
Data[5]	\x3f (= '?')
Data[6]	\x3f (= '?')
Data[7]	\x3f (= '?')
Data[8]	\x2e (= ':')
Data[9]	\x3f (= '?')
Data[10]	\x3f (= '?')
Data[11]	\x3f (= '?')
Data[12]	\x00
Checksum	\x08
Stop	\xff

file, list

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, list

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xc0
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x73 (= 's')
Data[10]	\x30 (= '0')
Data[11]	\x32 (= '2')
Data[12]	\x00
Data[13]	\x6e (= 'n')
Data[14]	\x74 (= 't')
Data[15]	\x73 (= 's')
Data[16]	\x63 (= 'c')
Data[17]	\x5f (= '_')
Data[18]	\x72 (= 'r')
Data[19]	\x67 (= 'g')
Data[20]	\x62 (= 'b')
Data[21]	\x2e (= ':')
Data[22]	\x63 (= 'c')
Data[23]	\x30 (= '0')
Data[24]	\x31 (= '1')
Data[25]	\x00
Checksum	\x40
Stop	\xff

file, list active

■ Description :

Get the filename of the active file.

■ Command :

Command[0]	\xc5
------------	------

■ Data :

No data bytes.

■ Example :

Get the filename of the active file on a projector with address \x01. Suppose the filename is "ntsc .c01".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xc5
Checksum	\xc6
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, list active

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xc5
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x31 (= '1')
Data[12]	\x00
Checksum	\xf0
Stop	\xff

file, load

- Description :
Load a specific file
- Command :

Command[0]	\xbd
Command[1]	\x82

- Data :
Filename (no wildcards allowed).
- Example :
Load a file named “test .c05”.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xbd
Command[1]	\x82
Data[0]	\x74 (= 't')
Data[1]	\x65 (= 'e')
Data[2]	\x73 (= 's')
Data[3]	\x74 (= 't')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x35 (= '5')
Data[12]	\x00
Checksum	\x76
Stop	\xff

file, load

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, move

■ Description :

Move file1 to file2.

- Only custom files can be moved.
- If the location specified by the "file index" of file2 has already been taken up, file2 will overwrite that contents.
- If file1 and file2 point to the same location, the base name of file1 is replaced by the base name of file2 without affecting other data.

■ Command :

Command[0]	\xc4
------------	------

■ Data :

From filename followed by the to filename (no wildcards allowed).

■ Example :

Move the file "ntsc .c01" to "camera1 .c05" on a projector with address \x01.

file, move

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xc4
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x31 (= '1')
Data[12]	\x00
Data[13]	\x63 (= 'c')
Data[14]	\x61 (= 'a')
Data[15]	\x6d (= 'm')
Data[16]	\x65 (= 'e')
Data[17]	\x72 (= 'r')
Data[18]	\x61 (= 'a')
Data[19]	\x31 (= '1')
Data[20]	\x20 (= ' ')
Data[21]	\x2e (= ':')
Data[22]	\x63 (= 'c')
Data[23]	\x30 (= '0')
Data[24]	\x35 (= '5')
Data[25]	\x00
Checksum	\x9f
Stop	\xff

file, move

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, read

■ Description :

Read the contents of a file.

- This command can be used to make a backup of your projector files on your hard disk. Use the command “file, write” to restore those files on your projector.
- The file contents is compressed and projector-dependent.
(It could even be version-dependent.)

■ Command :

Command[0]	\xbf
------------	------

■ Data :

Filename.

■ Return data :

Data[0..12] = filename.
Data[13] = length of file contents (bytes)
Data[14..] = file contents

■ Example (imaginary) :

Read the contents of the file "ntsc.c01" on a projector with address \x01.

file, read

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xbf
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x31 (= '1')
Data[12]	\x00
Checksum	\xea
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, read

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xbf
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x31(= '1')
Data[12]	\x00
Data[13]	\x05
Data[14]	\x56
Data[15]	\x22
Data[16]	\x37
Data[17]	\x19
Data[18]	\x53
Checksum	\x09
Stop	\xff

file, rename

■ Description :

Rename file1 to file2.

- Only custom files can be renamed.
- Only the base name of a file can be renamed. This means that file1 and file2 have to point to the same location (file1 and file2 must have the same "file index")

■ Command :

Command[0]	\xc3
------------	------

■ Data :

Old filename followed by the new filename (no wildcards allowed).

■ Example :

Rename the file "ntsc .c01" to "camera1 .c01" on a projector with address \x01.

file, rename

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xc3
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x31 (= '1')
Data[12]	\x00
Data[13]	\x63 (= 'c')
Data[14]	\x61 (= 'a')
Data[15]	\x6d (= 'm')
Data[16]	\x65 (= 'e')
Data[17]	\x72 (= 'r')
Data[18]	\x61 (= 'a')
Data[19]	\x31 (= '1')
Data[20]	\x20 (= ' ')
Data[21]	\x2e (= ':')
Data[22]	\x63 (= 'c')
Data[23]	\x30 (= '0')
Data[24]	\x31 (= '1')
Data[25]	\x00
Checksum	\x9a
Stop	\xff

file, rename

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

file, write

■ Description :

Write the contents of a file.

- This command can be used to restore files that were previously backed up on your hard disk to your projector. See the command "file, read" for more information on how to backup files to your hard disk.
- The file contents is compressed and projector-dependent. (It could even be version-dependent.)

■ Command :

Command[0]	\xbe
------------	------

■ Data :

- Data[0..12] = filename.
- Data[13] = length of file contents (bytes)
- Data[14..] = file contents

■ Example (imaginary) :

Write the contents of the file "ntsc .c01" on a projector with address \x01.

file, write

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xbe
Data[0]	\x6e (= 'n')
Data[1]	\x74 (= 't')
Data[2]	\x73 (= 's')
Data[3]	\x63 (= 'c')
Data[4]	\x20 (= ' ')
Data[5]	\x20 (= ' ')
Data[6]	\x20 (= ' ')
Data[7]	\x20 (= ' ')
Data[8]	\x2e (= ':')
Data[9]	\x63 (= 'c')
Data[10]	\x30 (= '0')
Data[11]	\x31 (= '1')
Data[12]	\x00
Data[13]	\x05
Data[14]	\x56
Data[15]	\x22
Data[16]	\x37
Data[17]	\x19
Data[18]	\x53
Checksum	\x09
Stop	\xff

file, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

frame delay, read

■ Description :

Read the actual value of the frame delay.

■ Command :

Command[0]	\x21
Command[1]	\x65

■ Data :

No data bytes.

■ Return data :

Data[0] = value of the frame delay.

	Data[0]
Off	\x00
On	\x01

■ Projector type :

Please verify the Owner's Manual of the projector if the frame delay is implemented.

■ Example :

Read the actual value of the frame delay of a projector with address \x01. Suppose the frame delay is on.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x65
Checksum	\x87
Stop	\xff

frame delay, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x65
Data[0]	\x01
Checksum	\x88
Stop	\xff

frame delay, write off

■ Description :

Set the frame delay off.

■ Command :

Command[0]	\x26
Command[1]	\x65

■ Data :

No data bytes.

■ Projector type :

Please verify the Owner's Manual of the projector if the frame delay is implemented.

■ Example :

Set the frame delay off on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x65
Checksum	\x8c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

frame delay, write on

■ Description :

Set the frame delay on.

■ Command :

Command[0]	\x27
Command[1]	\x65

■ Data :

No data bytes.

■ Projector type :

Please verify the Owner's Manual of the projector if the frame delay is implemented.

■ Example :

Set the frame delay on on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x65
Checksum	\x8d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

freeze, write off

- Description :

Disable freeze.

- Command :

Command[0]	\x26
Command[1]	\x23

- Data :

No data bytes.

- Example :

Disable freeze of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x23
Checksum	\xa4
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

freeze, write on

■ Description :

Enable freeze.

■ Command :

Command[0]	\x27
Command[1]	\x23

■ Data :

No data bytes.

■ Example :

Enable freeze of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x23
Checksum	\x4b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

gamma, decrement

■ Description :

Decrement gamma.

■ Command :

Command[0]	\x23
Command[1]	\x70

■ Data :

No data bytes.

■ Example :

Decrement the gamma of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x70
Checksum	\x94
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

gamma, increment

■ Description :

Increment gamma.

■ Command :

Command[0]	\x22
Command[1]	\x70

■ Data :

No data bytes.

■ Example :

Increment the gamma of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x70
Checksum	\x93
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

gamma, read

- Description :
Read the actual gamma value.
- Command :

Command[0]	\x21
Command[1]	\x70

- Data :
No data bytes.
- Return data :
Data[0] = gamma value.
- Example :
Read the actual gamma of a projector with address \x01.
Suppose the gamma equals \x05 (= 5).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x70
Checksum	\x92
Stop	\xff

gamma, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x70
Data[0]	\x05
Checksum	\x97
Stop	\xff

gamma, write

■ Description :

Write a new gamma value.

■ Command :

Command[0]	\x20
Command[1]	\x70

■ Data :

Data[0] = gamma value.

■ Example :

Set the gamma to \x05 (= 5) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x70
Data[0]	\x05
Checksum	\x96
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

horizontal period, read

- Description :

Read the horizontal period in nanoseconds.

- Command :

Command[0]	\x21
Command[1]	\x5b

- Data :

No data bytes.

- Return data :

Data[0..3] = horizontal period in nanoseconds.

Data[0]	MSB of value
Data[1]	
Data[2]	
Data[3]	LSB of value

- Example :

Read the horizontal period of the active source on a projector with address \x01. Suppose the active file is xga_60 with a horizontal period of 48360 ns.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5b
Checksum	\x7d
Stop	\xff

horizontal period, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5b
Data[0]	\x00
Data[1]	\x00
Data[2]	\xbc
Data[3]	\xe8
Checksum	\x21
Stop	\xff

horizontal period, write

- Description :

Write the horizontal period in nanoseconds.

- Command :

Command[0]	\x20
Command[1]	\x5b

- Data :

Data[0..3] = horizontal period in nanoseconds.

Data[0]	MSB of value
Data[1]	
Data[2]	
Data[3]	LSB of value

- Example :

Set the horizontal period to 48360 ns (xga_60) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x5b
Data[0]	\x00
Data[1]	\x00
Data[2]	\xbc
Data[3]	\xe8
Checksum	\x20
Stop	\xff

horizontal period, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

information display, read

- Description :

Read the information display codes.

- Command :

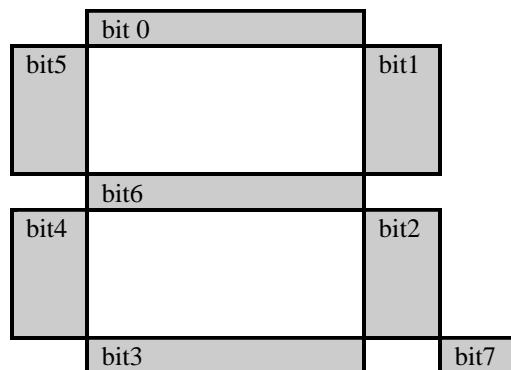
Command[0]	\x73
------------	------

- Data :

No data bytes.

- Return data :

Data[0]	high byte
Data[1]	low byte



bit7 = most significant bit

information display, read

■ Example :

Read the information display of a projector with address \x01. Suppose it shows "F1.".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x73
Checksum	\x74
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x73
Data[0]	\x71
Data[1]	\x86
Checksum	\x6b
Stop	\xff

infrared ports, read

- Description :

Read the status of the infrared ports.

- Command :

Command[0]	\x6f
------------	------

- Data :

No data bytes.

- Return data :

Data[0] = status.

bit#	bit = 0	bit = 1
bit0 (LSB)	receiver front disabled	receiver front enabled
bit1	receiver rear disabled	receiver rear enabled
bit2	no hardwired remote*	hardwired remote

* : when no hardwired remote is connected, bit 0 and bit 1 indicate the previous state of the corresponding receivers. (in reality, they are enabled)

infrared ports, read

■ Example :

Read the status of the infrared ports of a projector with address \x01. Suppose a hardwired remote is used and the front and rear receiver are enabled.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x6f
Checksum	\x70
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x6f
Data[0]	\x07
Checksum	\x77
Stop	\xff

infrared ports, write

- Description :

Enable/Disable one or more infrared ports.

- Command :

Command[0]	\x6e
------------	------

- Data :

Data[0] = status.

bit#	bit = 0	bit = 1
bit0 (LSB)	disable receiver front	enable receiver front
bit1	disable receiver rear	enable receiver rear

* : when no hardwired remote is connected, the receiver front and rear cannot be disabled; so bit0 and bit1 will take effect after a hardwired remote has been connected.

- Example :

Enable the front and rear receiver of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x6e
Data[0]	\x03
Checksum	\x72
Stop	\xff

infrared ports, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

installation, read

- Description :
Read installation.
- Command :

Command[0]	\x21
Command[1]	\x24

- Data :
No data bytes.
- Return data :
Data[0] = installation.

Installation	Data[0]
Front/Table	\x40
Front/Ceiling	\x80
Rear/Table	\x00
Rear/Ceiling	\xc0

- Example :
Read installation of a projector with address \x01.
Suppose the projector is installed in front/ceiling.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x24
Checksum	\x46
Stop	\xff

installation, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x24
Data[0]	\x80 \x00
Checksum	\xc6
Stop	\xff

installation, write

■ Description :

Write installation (front/table, ...).

■ Command :

Command[0]	\x20
Command[1]	\x24

■ Data :

Data[0] = installation.

Installation	Data[0]
Front/Table	\x40
Front/Ceiling	\x80
Rear/Table	\x00
Rear/Ceiling	\xc0

■ Example :

Set the installation of a projector with address \x01 to front/ceiling.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x24
Data[0]	\x80
	\x00
Checksum	\xc5
Stop	\xff

interlaced, read

- Description :

Read the actual value of interlaced.

- Command :

Command[0]	\x21
Command[1]	\x60

- Data :

No data bytes.

- Return data :

Data[0] = interlaced value.

	Data[0]
Not interlaced	\x00
Interlaced	\x01

- Example :

Read the actual value of interlaced of a projector with address \x01. Suppose the signal is interlaced.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x60
Checksum	\x82
Stop	\xff

interlaced, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x60
Data[0]	\x00
Checksum	\x82
Stop	\xff

interlaced, write off

■ Description :

Tell the projector the signal applied is not interlaced.

■ Command :

Command[0]	\x26
Command[1]	\x60

■ Data :

No data bytes.

■ Example :

Define the signal as not interlaced on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x60
Checksum	\x87
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

interlaced, write on

- Description :

Tell the projector the signal applied is interlaced.

- Command :

Command[0]	\x27
Command[1]	\x60

- Data :

No data bytes.

- Example :

Define the signal as interlaced on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x60
Checksum	\x88
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

internal pattern, write

■ Description :

Write an internally generated pattern.

■ Command :

Command[0]	\x41
------------	------

■ Data :

Convergence green

Data[0]	\x01
---------	------

Convergence red/green

Data[0]	\x02
---------	------

Convergence blue/green

Data[0]	\x03
---------	------

Convergence red/blue/green

Data[0]	\x21
Data[1]	\x20

Hatch

Data[0]	\x04
---------	------

Checkerboard

Data[0]	\x19
---------	------

Color bars

Data[0]	\x1a
---------	------

Multiburst

Data[0]	\x1b
---------	------

internal pattern, write

Outline

Data[0]	\x1c
---------	------

Alpha numeric characters

Data[0]	\x23
---------	------

Page character

Data[0]	\x22
Data[1]	ascii code of an alphabetic character

Purity

Data[0]	\x20
---------	------

To change the color of the purity pattern, use the command “overlay palette, write” and change palette entry 1.

Leveling pattern (coarse)

Data[0]	\x24
Data[1]	\x01 (red) or \x02 (green) or \x03 (blue)
Data[2]	\x01 (position 1) or \x02 (position 2) or \x03 (position 3) or \x04 (position 4) or \x05 (position 5) or \x06 (position 6)

internal pattern, write

Leveling pattern (fine)

Data[0]	\x25
Data[1]	\x01 (red) or \x02 (green) or \x03 (blue)
Data[2]	\x01 (position 1) or \x02 (position 2) or \x03 (position 3) or \x04 (position 4) or \x05 (position 5) or \x06 (position 6)
Data[3]	\x00..\x255 ("contrast" level)

Note :

All data bytes mentioned above can optionally be followed by an extra byte to indicate that the pattern must be inverted or not. (exception : Purity)

	Data[next] ^{OPTIONAL}
not inverted	\x00
inverted	\x01

internal pattern, write

■ Example :

Write the purity internal pattern on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x41
Data[0]	\x20
Checksum	\x62
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

keystone horizontal, decrement

■ Description :

Decrement the horizontal keystone.

■ Command :

Command[0]	\x23
Command[1]	\x50

■ Data :

No data bytes.

■ Example :

Decrement the horizontal keystone of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x50
Checksum	\x74
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

keystone horizontal, increment

■ Description :

Increment the horizontal keystone.

■ Command :

Command[0]	\x22
Command[1]	\x50

■ Data :

No data bytes.

■ Example :

Increment the horizontal keystone of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x50
Checksum	\x73
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

keystone horizontal, read

- Description :

Read the actual value of the horizontal keystone.

- Command :

Command[0]	\x21
Command[1]	\x50

- Data :

No data bytes.

- Return data :

Data[0..1] = value of the horizontal keystone.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of the horizontal keystone of a projector with address \x01. Suppose the horizontal keystone equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x50
Checksum	\x72
Stop	\xff

keystone horizontal, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x50
Data[0]	\x00
Data[1]	\x00
Checksum	\x72
Stop	\xff

keystone horizontal, write

■ Description :

Write a new value for the horizontal keystone.

■ Command :

Command[0]	\x20
Command[1]	\x50

■ Data :

Data[0..1] = value of the horizontal keystone.

Data[0]	MSB of value
Data[1]	LSB of value

■ Example :

Set the horizontal keystone to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x50
Data[0]	\x00
Data[1]	\x00
Checksum	\x71
Stop	\xff

keystone horizontal, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lamp, read article number

■ Description :

Read the article number of the lamp.

■ Command :

Command[0]	\x76
Command[1]	\x84

■ Data :

No data bytes.

■ Return data :

The return data-transfer being the lamp article number is a C-language string (see syntax).

■ Projector type :

Only for projectors that have a memory chip attached to the lamp.

■ Example :

Read the lamp article number of a projector with address \x01. Suppose the lamp article number is 'R9840740'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x84
Checksum	\xfb
Stop	\xff

lamp, read article number

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x84
Data[0]	\x52 (= 'R')
Data[1]	\x39 (= '9')
Data[2]	\x38 (= '8')
Data[3]	\x34 (= '4')
Data[4]	\x30 (= '0')
Data[5]	\x37 (= '7')
Data[6]	\x34 (= '4')
Data[7]	\x30 (= '0')
Data[8]	\x00
Checksum	\xbd
Stop	\xff

lamp, read CLO status

- Description :

Read the status (on/off) of the CLO.

- Command :

Command[0]	\x76
Command[1]	\x96

- Data :

No data bytes.

- Return data :

Data[0] = status.

Status	Data[0]
Off	\x00
On	\x01

- Projector type :

All projectors where the CLO has been installed.

lamp, read CLO status

■ Example :

Read the status of the CLO of a projector with address \x01. Suppose the CLO is turned on.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x96
Checksum	\xd0
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x96
Data[0]	\x01
Checksum	\xe0
Stop	\xff

lamp, read history

■ Description :

Read the lamp run time history list.

■ Command :

Command[0]	\x74
------------	------

■ Data :

No data bytes.

■ Return data :

Lamp[0] serial number	c-language string
Lamp[0] run time	see formula below
Lamp[1] serial number	c-language string
Lamp[1] run time	see formula below
...	
Lamp[n-1] run time	see formula below
Lamp[n-1] serial number	c-language string

n = number of lamps stored in the history list

- c-language string (see syntax).

- formula lamp run time :

$$\text{Lamp run time (hours)} = \text{Data}[1]*256 + \text{Data}[0]$$

lamp, read maximum run time

- Description :

Read the maximum lamp run time in seconds. This is the maximum guaranteed run time for the lamp.

- Command :

Command[0]	\x76
Command[1]	\x89

- Data :

No data bytes.

- Return data :

The return data-transfer being the maximum lamp run time in seconds consists of four data bytes. The first byte is the most significant byte !

Formula :

$$\begin{aligned} \text{Maximum lamp run time (seconds)} \\ = \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3] \end{aligned}$$

- Projector type :

Not all projectors support this command.

- Example :

Read the maximum lamp run time of a projector with address \x01. Suppose the maximum is 1000 hours.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x89
Checksum	\x00
Stop	\xff

lamp, read maximum run time

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x89
Data[0]	\x00
Data[1]	\x36
Data[2]	\xee
Data[3]	\x80 \x00
Checksum	\xa4
Stop	\xff

maximum lamp run time =
 $\text{\x00} * 256^3 + \text{\x36} * 256^2 + \text{\xee} * 256 + \text{\x80}$

lamp, read message run time

- Description :

Read the run time when the message menu, indicating the remaining lamp run time, first occurs. This message menu is displayed for 1 minute and is repeated every 30 minutes

- Command :

Command[0]	\x76
Command[1]	\x8b

- Data :

No data bytes.

- Return data :

The return data-transfer being the lamp message run time in seconds consists of four data bytes. The first byte is the most significant byte !

Formula :

$$\begin{aligned} \text{Lamp message run time (seconds)} \\ = \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3] \end{aligned}$$

- Projector type :

Not all projectors support this command.

- Example :

Read the lamp message run time of a projector with address \x01. Suppose the message appears at 970 hours.

lamp, read message run time

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x8b
Checksum	\x02
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x8b
Data[0]	\x00
Data[1]	\x35
Data[2]	\x48
Data[3]	\xa0
Checksum	\x1f
Stop	\xff

$$\text{lamp message run time} = \\ \x00 * 256^3 + \x35 * 256^2 + \x48 * 256 + \xa0$$

lamp, read run time

■ Description :

Read the lamp run time in hours.

■ Command :

Command[0]	\x64
------------	------

■ Data :

No data bytes.

■ Return data :

The return data-transfer being the lamp run time in hours consists of four data bytes. The first byte is the most significant byte !

Formula :

$$\begin{aligned} \text{Lamp run time (hours)} \\ = \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3] \end{aligned}$$

■ Example :

Read the lamp run time of a projector with address \x01.

Suppose the lamp run time is 100 hours.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x64
Checksum	\x65
Stop	\xff

lamp, read run time

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x64
Data[0]	\x00
Data[1]	\x00
Data[2]	\x00
Data[3]	\x64
Checksum	\xc9
Stop	\xff

lamp run time =

$$\x00 * 256^3 + \x00 * 256^2 + \x00 * 256 + \x64$$

lamp, read serial number (1)

- Description :
Read the serial number of the lamp.
- Command :

Command[0]	\x63
------------	------
- Data :
No data bytes.
- Return data :
The return data-transfer being the lamp serial number is a pascal-language string (see syntax).
- Example :
Read the lamp serial number of a projector with address \x01. Suppose the lamp serial number is '0655230'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x63
Checksum	\x64
Stop	\xff

lamp, read serial number (1)

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x63
Data[0]	\x07
Data[1]	\x30 (= '0')
Data[2]	\x36 (= '6')
Data[3]	\x35 (= '5')
Data[4]	\x35 (= '5')
Data[5]	\x32 (= '2')
Data[6]	\x33 (= '3')
Data[7]	\x30 (= '0')
Checksum	\xd0
Stop	\xff

lamp, read serial number (2)

■ Description :

Read the serial number of the lamp.

■ Command :

Command[0]	\x76
Command[1]	\x86

■ Data :

No data bytes.

■ Return data :

The return data-transfer being the lamp serial number is a C-language string (see syntax).

■ Projector type :

Only for projectors that have a memory chip attached to the lamp.

■ Example :

Read the lamp serial number of a projector with address \x01. Suppose the lamp serial number is '0655230'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x86
Checksum	\xfd
Stop	\xff

lamp, read serial number (2)

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x86
Data[0]	\x30 (= '0')
Data[1]	\x36 (= '6')
Data[2]	\x35 (= '5')
Data[3]	\x35 (= '5')
Data[4]	\x32 (= '2')
Data[5]	\x33 (= '3')
Data[6]	\x30 (= '0')
Data[7]	\x00
Checksum	\x62
Stop	\xff

lamp, read status

- Description :
Read the lamp status.

- Command :

Command[0]	\x6c
------------	------

- Data :
No data bytes.
- Return data :

Data[0] = lamp status.
Only bit0 (least significant bit) is significant.

bit#	bit = 0	bit = 1
bit0	nominal power	high power

- Projector type :
BD8100, BG8100, BG8200, BG9200.
- Example :
Read the lamp status of a projector with address \x01.
Suppose the lamp is configured in high power.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x6c
Checksum	\x6d
Stop	\xff

lamp, read status

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x6c
Data[0]	\x01
Checksum	\x6e
Stop	\xff

lamp, read strikes

- Description :

Read the number of strikes of the lamp. This is the number of times the lamp has been switched on.

- Command :

Command[0]	\x76
Command[1]	\x8e

- Data :

No data bytes.

- Return data :

The return data-transfer being the number of strikes consists of four data bytes. The first byte is the most significant byte !

Formula :

$$\begin{aligned} \text{Number of strikes} \\ = \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3] \end{aligned}$$

- Projector type :

Only for projectors that have a memory chip attached to the lamp.

lamp, read strikes

■ Example :

Read the number of lamp strikes of a projector with address \x01. Suppose the number of strikes is 1000.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x8e
Checksum	\x05
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x8e
Data[0]	\x00
Data[1]	\x00
Data[2]	\x03
Data[3]	\xe8
Checksum	\xf0
Stop	\xff

lamp, read warning run time

- Description :

Read the run time when the warning menu, indicating the end of life of the lamp, first occurs. This warning menu is displayed on the screen and is repeated every 30 minutes

- Command :

Command[0]	\x76
Command[1]	\x8c

- Data :

No data bytes.

- Return data :

The return data-transfer being the lamp warning run time in seconds consists of four data bytes. The first byte is the most significant byte !

Formula :

$$\begin{aligned} \text{Lamp warning run time (seconds)} \\ = \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3] \end{aligned}$$

- Projector type :

Not all projectors support this command.

- Example :

Read the lamp warning run time of a projector with address \x01. Suppose the message appears at 1000 hours.

lamp, read warning run time

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x8c
Checksum	\x03
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x8c
Data[0]	\x00
Data[1]	\x36
Data[2]	\xee
Data[3]	\x80 \x00
Checksum	\xa7
Stop	\xff

$$\begin{aligned} \text{lamp warning run time} = \\ \text{\x00} * 256^3 + \text{\x36} * 256^2 + \text{\xee} * 256 + \text{\x80} \end{aligned}$$

lamp, reset run time

- Description :

Reset the lamp run time (after installation of a new lamp).

- Command :

Command[0]	\x68
------------	------

- Data :

The data being the lamp serial number is a pascal-language string (see syntax) with length 7.

Data[0]	\x07
Data[1]	\x30..\\x39
Data[2]	\x30..\\x39
Data[3]	\x30..\\x39
Data[4]	\x30..\\x39
Data[5]	\x30..\\x39
Data[6]	\x30..\\x39
Data[7]	\x30..\\x39

- Projector type :

Only for projectors that don't have a memory chip attached to the lamp. See your Owner's Manual if the "Reset Lamp Runtime" item exists in the menu structure.

lamp, write CLO status

■ Description :

Set the CLO on or off.

■ Command :

Command[0]	\x76
Command[1]	\x16

■ Data :

Data[0] = Status

Status	Data[0]
Off	\x00
On	\x01

■ Projector type :

All projectors where the CLO has been installed.

lamp, write CLO status

■ Example :

Set the CLO on of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x16
Data[0]	\x01
Checksum	\x8e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lamp, write status

- Description :
Write a new lamp status.
- Command :

Command[0]	\xc6
------------	------

- Data :
Data[0] = lamp status.
Only bit0 (least significant bit) is significant.

bit#	bit = 0	bit = 1
bit0	nominal power	high power

- Projector type :
BD8100(LC), BG8100(LC), BG8200(LC), BG9200(LC).
- Example :
Set the lamp status to high power of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xc6
Data[0]	\x01
Checksum	\xc8
Stop	\xff

lamp, write status

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

language, read

- Description :

Read the language used for the on-screen-display.

- Command :

Command[0]	\x71
------------	------

- Data :

No data bytes.

- Projector type :

See your Owner's Manual to verify what languages are supported by the projector software.

- Return data :

Data[0] = language.

Language	Data[0]
English (International)	\x00
French	\x01
Spanish	\x02
Deutsch	\x03
Chinese	\x04

- Example :

Read the language used for the on-screen-display of a projector with address \x01. Suppose the language is "English (International)".

language, read

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x71
Checksum	\x72
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x71
Data[0]	\x00
Checksum	\x72
Stop	\xff

language, write

■ Description :

Change the language used for the on-screen-display.

■ Command :

Command[0]	\x70
------------	------

■ Data :

Data[0] = language.

Language	Data[0]
English (International)	\x00
French	\x01
Spanish	\x02
Deutsch	\x03
Chinese	\x04

■ Projector type :

See your Owner's Manual to verify what languages are supported by the projector software.

■ Example :

Change the language used for the on-screen-display of a projector with address \x01 to "English (International)".

language, write

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x70
Data[0]	\x00
Checksum	\x71
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lens, bridge

- Description :
Open or close the lens bridge.
- Command :

Command[0]	\xf4
Command[1]	\x85

- Data :

Direction	Data[0]
Up	\x00
Down	\x01
- Projector type :
All projectors with motorized lens bridge.
- Example :
Open the bridge of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf4
Command[1]	\x85
Data[0]	\x00
Checksum	\x7a
Stop	\xff

lens, bridge

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lens, focus

■ Description :

Focus the lens.

■ Command :

Command[0]	\xf4
Command[1]	\x83

■ Data :

Data[0] = direction.

Direction	Data[0]
Near	\x00
Far	\x01

■ Projector type :

All projectors with motorized lens adjustment.

■ Example :

Focus the lens of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf4
Command[1]	\x83
Data[0]	\x00
Checksum	\x78
Stop	\xff

lens, focus

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lens, shift

■ Description :

Shift the lens up, down, left or right.

■ Command :

Command[0]	\xf4
Command[1]	\x81

■ Data :

Data[0] = direction.

Direction	Data[0]
Up	\x00
Down	\x01
Left	\x02
Right	\x03

■ Projector type :

All projectors with motorized lens adjustment.

■ Example :

Shift the lens up of of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf4
Command[1]	\x81
Data[0]	\x00
Checksum	\x76
Stop	\xff

lens, shift

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lens, tilt

- Description :
Change the tilt of the projector.
- Command :

Command[0]	\xf4
Command[1]	\x84

- Data :
Data[0] = direction.

Direction	Data[0]
Counterclockwise	\x00
Clockwise	\x01

- Projector type :
All projectors with motorized tilt adjustment.
- Example :
Change the tilt in counterwise direction of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf4
Command[1]	\x84
Data[0]	\x01
Checksum	\x7a
Stop	\xff

lens, tilt

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lens, zoom

■ Description :

Zoom the lens.

■ Command :

Command[0]	\xf4
Command[1]	\x82

■ Data :

Data[0] = direction.

Direction	Data[0]
In	\x00
Out	\x01

■ Projector type :

All projectors with motorized lens adjustment.

■ Example :

Lens-zoom-in of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf4
Command[1]	\x82
Data[0]	\x00
Checksum	\x77
Stop	\xff

lens, zoom

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lines active, decrement

■ Description :

Decrement the active number of lines.

■ Command :

Command[0]	\x23
Command[1]	\x59

■ Data :

No data bytes.

■ Example :

Decrement the active number of lines on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x59
Checksum	\x7d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lines active, increment

- Description :

Increment the active number of lines.

- Command :

Command[0]	\x22
Command[1]	\x59

- Data :

No data bytes.

- Example :

Increment the active number of lines on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x59
Checksum	\x7c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lines active, read

- Description :

Read the active number of lines.

- Command :

Command[0]	\x21
Command[1]	\x59

- Data :

No data bytes.

- Return data :

Data[0..1] = active number of lines.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the active number of lines on a projector with address \x01. Suppose the active number of lines is 480 (\x01e0).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x59
Checksum	\x7b
Stop	\xff

lines active, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x59
Data[0]	\x01
Data[1]	\xe0
Checksum	\x5c
Stop	\xff

lines active, write

- Description :

Change the active number of lines.

- Command :

Command[0]	\x20
Command[1]	\x59

- Data :

Data[0..1] = active number of lines.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the active number of lines to 480 (\x01e0) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x59
Data[0]	\x01
Data[1]	\xe0
Checksum	\x5b
Stop	\xff

lines active, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

line start, decrement

■ Description :

Decrement the value of line start.

■ Command :

Command[0]	\x23
Command[1]	\x5a

■ Data :

No data bytes.

■ Example :

Decrement line start on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x5a
Checksum	\x7e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

line start, increment

■ Description :

Increment the value of line start.

■ Command :

Command[0]	\x22
Command[1]	\x5a

■ Data :

No data bytes.

■ Example :

Increment line start on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x5a
Checksum	\x7d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

line start, read

- Description :
Read the value of line start.
- Command :

Command[0]	\x21
Command[1]	\x5a

- Data :
No data bytes.
- Return data :
Data[0..1] = line start.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :
Read the value of line start on a projector with address \x01. Suppose the value is 20 (\x0014).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5a
Checksum	\x7c
Stop	\xff

line start, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5a
Data[0]	\x00
Data[1]	\x14
Checksum	\x90
Stop	\xff

line start, write

- Description :
Change the value of line start.
- Command :

Command[0]	\x20
Command[1]	\x5a

- Data :
Data[0..1] = line start.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :
Set the value of line start to 20 (\x0014) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x5a
Data[0]	\x00
Data[1]	\x14
Checksum	\x8f
Stop	\xff

line start, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lines total, decrement

■ Description :

Decrement the total number of lines.

■ Command :

Command[0]	\x23
Command[1]	\x58

■ Data :

No data bytes.

■ Example :

Decrement the total number of lines on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x58
Checksum	\x7c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lines total, increment

■ Description :

Increment the total number of lines.

■ Command :

Command[0]	\x22
Command[1]	\x58

■ Data :

No data bytes.

■ Example :

Increment the total number of lines on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x58
Checksum	\x7b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lines total, read

- Description :

Read the total number of lines.

- Command :

Command[0]	\x21
Command[1]	\x58

- Data :

No data bytes.

- Return data :

Data[0..1] = total number of lines.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the total number of lines on a projector with address \x01. Suppose the total number of lines is 525 (\x020d).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x58
Checksum	\x7a
Stop	\xff

lines total, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x58
Data[0]	\x02
Data[1]	\x0d
Checksum	\x89
Stop	\xff

lines total, write

- Description :

Change the total number of lines.

- Command :

Command[0]	\x20
Command[1]	\x58

- Data :

Data[0..1] = total number of lines.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the total number of lines to 525 (\x020d) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x58
Data[0]	\x02
Data[1]	\x0d
Checksum	\x88
Stop	\xff

lines total, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

lock audio, read

- Description :

Read the status of the audio lock.

- Command :

Command[0]	\x21
Command[1]	\x3f

- Data :

No data bytes.

- Return data :

Data[0] = lock specification.

Lock	Data[0]
Off	\x00
Input 1 or A	\x01
Input 2 or B	\x02
Input 3 or C	\x03

- Projector type :

BD2100(LC), BD3000(LC), BD3100(LC), BD3200(LC),
BD3300(LC).

- Example :

Read the audio lock status of a projector with address \x01. Suppose the audio signal is locked on audio input 1.

lock audio, read

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x3f
Checksum	\x61
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x3f
Data[0]	\x01
Checksum	\x62
Stop	\xff

lock audio, write

- Description :

Lock the audio signal to a specific audio input or set the lock off (audio input follows the video input).

- Command :

Command[0]	\x20
Command[1]	\x3f

- Data :

Data[0] = lock specification.

Lock	Data[0]
Off	\x00
Input 1 or A	\x01
Input 2 or B	\x02
Input 3 or C	\x03

- Projector type :

BD2100(LC), BD3000(LC), BD3100(LC), BD3200(LC),
BD3300(LC).

- Example :

Lock the audio signal on audio input 1 of a projector with address \x01.

lock audio, write

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x3f
Data[0]	\x01
Checksum	\x61
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

logo, read background

- Description :

Read the background (on or off) of the logo.

- Command :

Command[0]	\xf1
Command[1]	\x82

- Data :

No data bytes.

- Return data :

Data[0] = logo background.

Background	Data[0]
Off (transparent)	\x00
On (black)	\x01

- Example :

Read the background of the logo of a projector with address \x01. Suppose the background is off.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x82
Checksum	\x74
Stop	\xff

logo, read background

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x82
Data[0]	\x00
Checksum	\x74
Stop	\xff

logo, read hot-key

■ Description :

Read the hot-key used to turn the logo on or off in operational mode.

■ Command :

Command[0]	\xf1
Command[1]	\x83

■ Data :

No data bytes.

■ Return data :

Data[0] = logo hot-key.

Hot-key	Data[0]
Off	\x00
<TEXT>	\xd0

■ Example :

Read the hot-key of the logo of a projector with address \x01. Suppose the hot-key is off.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x83
Checksum	\x75
Stop	\xff

logo, read hot-key

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x83
Data[0]	\x00
Checksum	\x75
Stop	\xff

logo, read position

- Description :

Read the position of the logo.

- Command :

Command[0]	\xf1
Command[1]	\x84

- Data :

No data bytes.

- Return data :

Data[0] = horizontal position.

Data[1] = vertical position.

- Example :

Read the position of the logo of a projector with address \x01. Suppose the position equals (1, 1).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x84
Checksum	\x76
Stop	\xff

logo, read position

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x84
Data[0]	\x01
Data[1]	\x01
Checksum	\x78
Stop	\xff

logo, read status

■ Description :

Read the status (on or off) of the logo.

■ Command :

Command[0]	\xf1
Command[1]	\x81

■ Data :

No data bytes.

■ Return data :

Data[0] = logo status.

Status	Data[0]
Off	\x00
On	\x01

■ Example :

Read the status of the logo of a projector with address \x01. Suppose the status is on.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x81
Checksum	\x73
Stop	\xff

logo, read status

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x81
Data[0]	\x01
Checksum	\x74
Stop	\xff

logo, write background

■ Description :

Change the background of the logo (set the background on or off).

■ Command :

Command[0]	\xf1
Command[1]	\x02

■ Data :

Data[0] = logo background.

Background	Data[0]
Off (transparent)	\x00
On (black)	\x01

■ Example :

Set the logo background off of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x02
Data[0]	\x00
Checksum	\xf4
Stop	\xff

logo, write background

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

logo, write hot-key

■ Description :

Setup a hot-key to turn the logo on or off in operational mode.

■ Command :

Command[0]	\xf1
Command[1]	\x03

■ Data :

Data[0] = logo hot-key.

Hot-key	Data[0]
Off	\x00
<TEXT>	\xd

■ Example :

Set the logo hot-key to <TEXT> of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x03
Data[0]	\xd
Checksum	\x02
Stop	\xff

logo, write hot-key

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

logo, write position

■ Description :

Change the position of the logo.

■ Command :

Command[0]	\xf1
Command[1]	\x04

■ Data :

Data[0] = horizontal position.

Data[1] = vertical position.

■ Example :

Set the logo position to (1, 1) of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x04
Data[0]	\x01
Data[1]	\x01
Checksum	\xf8
Stop	\xff

logo, write position

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

logo, write status

■ Description :

Change the status of the logo (set the logo on or off).

■ Command :

Command[0]	\xf1
Command[1]	\x01

■ Data :

Data[0] = logo status.

Status	Data[0]
Off	\x00
On	\x01

■ Example :

Set the logo on of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf1
Command[1]	\x01
Data[0]	\x01
Checksum	\xf4
Stop	\xff

logo, write status

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

network, read configuration

- Description :
Read the network configuration.
- Command :

Command[0]	\x11
Command[1]	\x01

- Data :
No data bytes.
- Return data :
Data[0] = DHCP Status
Data[1..4] = IP Address (aaa.bbb.cccddd)
Data[5..8] = Subnet Mask (aaa.bbb.cccddd)
Data[9..12] = Default Gateway (aaa.bbb.cccddd)
Data[13..18] = MAC Address (aa:bb:cc:dd:ee:ff)

DHCP Status	Data[0]
disabled (off)	\x00
enabled (on)	\x01

aaa.bbb.ccc.ddd	
aaa	Data[m]
bbb	Data[m+1]
ccc	Data[m+2]
ddd	Data[m+3]

network, read configuration

aa:bb:cc:dd:ee:ff	
aa	Data[n]
bb	Data[n+1]
cc	Data[n+2]
dd	Data[n+3]
ee	Data[n+4]
ff	Data[n+5]

If the network configuration could not be determined, only one data byte is returned (Data[0] = \x02).

- Projector type :
All DLP based projectors with network functionality.

network, read configuration

■ Example :

Read the network configuration of a projector with address \x01.

Suppose the network configuration is :

DHCP Status : on
IP Address : 150.158.195.214
Subnet Mask : 255.255.248.0
Default Gateway : 150.158.192.1
MAC Address : 00:01:02:DB:FF:89

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x11
Command[1]	\x01
Checksum	\x13
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

network, read configuration

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x11
Command[1]	\x01
Data[0]	\x01
Data[1]	\x96
Data[2]	\x9e
Data[3]	\xc3
Data[4]	\xd6
Data[5]	\x80 \x7f
Data[6]	\x80 \x7f
Data[7]	\xf8
Data[8]	\x00
Data[9]	\x96
Data[10]	\x9e
Data[11]	\xc0
Data[12]	\x01
Data[13]	\x00
Data[14]	\x01
Data[15]	\x02
Data[16]	\xdb
Data[17]	\x80 \x7f
Data[18]	\x89
Checksum	\x32
Stop	\xff

network, write configuration

- Description :

Write the network configuration.

- Command :

Command[0]	\x11
Command[1]	\x81

- Data :

Data[0] = DHCP Status

DHCP Status	Data[0]
disable (off)	\x00
enable (on)	\x01

If Data[0] equals \x00, 12 more data bytes (Data[1..12]) must be sent.

Data[1..4] = IP Address (aaa.bbb.ccc.ddd)

Data[5..8] = Subnet Mask (aaa.bbb.ccc.ddd)

Data[9..12] = Default Gateway (aaa.bbb.ccc.ddd)

aaa.bbb.ccc.ddd	
aaa	Data[m]
bbb	Data[m+1]
ccc	Data[m+2]
ddd	Data[m+3]

- Projector type :

All DLP based projectors with network functionality.

network, write configuration

■ Example :

Write the network configuration of a projector with address \x01.

Suppose the network configuration is :

DHCP Status : off
IP Address : 150.158.195.214
Subnet Mask : 255.255.248.0
Default Gateway : 150.158.192.1

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x11
Command[1]	\x81
Data[0]	\x00
Data[1]	\x96
Data[2]	\x9e
Data[3]	\xc3
Data[4]	\xd6
Data[5]	\x80 \x7f
Data[6]	\x80 \x7f
Data[7]	\xf8
Data[8]	\x00
Data[9]	\x96
Data[10]	\x9e
Data[11]	\xc0
Data[12]	\x01
Checksum	\x4b
Stop	\xff

network, write configuration

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

menu, exit

- Description :
Exit one/all menus.
- Command :

Command[0]	\x42
Command[1]	\x01

- Data :

Data[0]	
\x01	Exit one menu
\xff	Exit all menus
- Example :
Exit all menus on a projector with address \x01. (Go back to operational mode)

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x42
Command[1]	\x01
Data[0]	\x80 \x7f
Checksum	\x43
Stop	\xff

menu, exit

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

MOCA, read version

■ Description :

Read the version of the MOCA software.

■ Command :

Command[0]	\xf3
Command[1]	\x82

■ Data :

No data bytes.

■ Return data :

The return data-transfer being the software version is a c-language string (see syntax).

Note : there is no return data when the MOCA processor doesn't respond (not installed or busy).

■ Projector type :

All projectors equipped with MOCA.

■ Example :

Read the version of the MOCA software on a projector with address \x01. Suppose the version number is '1.02'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x82
Checksum	\x76
Stop	\xff

MOCA, read version

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x82
Data[0]	\x31 (= '1')
Data[1]	\x2e (= ':')
Data[2]	\x30 (= '0')
Data[3]	\x32 (= '2')
Data[4]	\x00
Checksum	\x37
Stop	\xff

MOCA, set blue to midposition

■ Description :

Set the "blue motors" of the MOCA to midposition.

■ Command :

Command[0]	\xf3
Command[1]	\x06

■ Data :

No data bytes.

■ Projector type :

All projectors equipped with MOCA.

■ Example :

Set the "blue motors" of the MOCA on a projector with address \x01 to midposition.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x06
Checksum	\xfa
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

MOCA, set green to midposition

■ Description :

Set the "green motors" of the MOCA to midposition.

■ Command :

Command[0]	\xf3
Command[1]	\x04

■ Data :

No data bytes.

■ Projector type :

All projectors equipped with MOCA.

■ Example :

Set the "green motors" of the MOCA on a projector with address \x01 to midposition.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x04
Checksum	\xf8
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

MOCA, set red to midposition

■ Description :

Set the "red motors" of the MOCA to midposition.

■ Command :

Command[0]	\xf3
Command[1]	\x05

■ Data :

No data bytes.

■ Projector type :

All projectors equipped with MOCA.

■ Example :

Set the "red motors" of the MOCA on a projector with address \x01 to midposition.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x05
Checksum	\xf9
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

MOCA, set to midposition

■ Description :

Set all motors of the MOCA to midposition.

■ Command :

Command[0]	\xf3
Command[1]	\x07

■ Data :

No data bytes.

■ Projector type :

All projectors equipped with MOCA.

■ Example :

Set all motors of the MOCA on a projector with address \x01 to midposition.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x07
Checksum	\xfb
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

MOCA, write blue

■ Description :

Change the state of a "blue motor" of the MOCA.

■ Command :

Command[0]	\xf3
Command[1]	\x03

■ Data :

Data[0] = Position on the screen (see osd internal pattern)

Position	Data[0]
1	\x01
2	\x02
3	\x03
4	\x04
5	\x05
6	\x06
7	\x07

Data[1] = Direction (see osd internal pattern)

Direction	Data[1]
Up	\x01
Down	\x02
Left	\x03
Right	\x04

MOCA, write blue

- Projector type :
All projectors equipped with MOCA.
- Example :
Change the state of a "blue motor" of the MOCA on a projector with address \x01 by executing "6 up".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x03
Data[0]	\x06
Data[1]	\x01
Checksum	\x80 \x7e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

MOCA, write green

■ Description :

Change the state of a "green motor" of the MOCA.

■ Command :

Command[0]	\xf3
Command[1]	\x01

■ Data :

Data[0] = Position on the screen (see osd internal pattern)

Position	Data[0]
1	\x01
2	\x02
3	\x03
4	\x04
5	\x05
6	\x06
7	\x07

Data[1] = Direction (see osd internal pattern)

Direction	Data[1]
Up	\x01
Down	\x02
Left	\x03
Right	\x04

MOCA, write green

- Projector type :
All projectors equipped with MOCA.
- Example :
Change the state of a "green motor" of the MOCA on a projector with address \x01 by executing "6 up".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x01
Data[0]	\x06
Data[1]	\x01
Checksum	\xfc
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

MOCA, write red

■ Description :

Change the state of a "red motor" of the MOCA.

■ Command :

Command[0]	\xf3
Command[1]	\x02

■ Data :

Data[0] = Position on the screen (see osd internal pattern)

Position	Data[0]
1	\x01
2	\x02
3	\x03
4	\x04
5	\x05
6	\x06
7	\x07

Data[1] = Direction (see osd internal pattern)

Direction	Data[1]
Up	\x01
Down	\x02
Left	\x03
Right	\x04

MOCA, write red

- Projector type :
All projectors equipped with MOCA.
- Example :
Change the state of a "red motor" of the MOCA on a projector with address \x01 by executing "6 up".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf3
Command[1]	\x02
Data[0]	\x06
Data[1]	\x01
Checksum	\xfd
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

overlay palette, write

■ Description :

Write an overlay color, used for the OSD.

■ Command :

Command[0]	\x0f
------------	------

■ Data :

Data[0]	Palette entry
Data[1]	Red.MSB
Data[2]	Red.LSB
Data[3]	Green.MSB
Data[4]	Green.LSB
Data[5]	Blue.MSB
Data[6]	Blue.LSB

Projector type	Palette entry
BD3000(LC), BD3100(LC), BD5100(LC), BD8100(LC)	\x01..\x0f
Others	\x01..\x3f

Projector type	Red/Green/Blue
	\x0000..\x03ff
	\x0000..\x00ff

■ Projector type :

All projectors except BD5000 and BD8000.

overlay palette, write

■ Example :

Write maximum white to palette entry 1 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x0f
Data[0]	\x01
Data[1]	\x80 \x7f
Data[2]	\x80 \x7f
Data[3]	\x80 \x7f
Data[4]	\x80 \x7f
Data[5]	\x80 \x7f
Data[6]	\x80 \x7f
Checksum	\xb0
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

panel, read size

- Description :

Read the size (in pixels) of the lcd panel.

- Command :

Command[0]	\xf0
Command[1]	\x01

- Data :

No data bytes.

- Return data :

Data[0..1] = number of pixels in horizontal direction.

Data[2..3] = number of pixels in vertical direction.

Data[0]	MSB of hpix
Data[1]	LSB of hpix
Data[2]	MSB of vpix
Data[3]	LSB of vpix

panel, read size

■ Example :

Read the size of the lcd panel of a projector with address \x01. Suppose the size is 1024 x 768 pixels.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf0
Command[1]	\x01
Checksum	\xf2
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xf0
Command[1]	\x01
Data[0]	\x04
Data[1]	\x00
Data[2]	\x03
Data[3]	\x00
Checksum	\xf9
Stop	\xff

peripheral source, write

■ Description :

Select a source on an external switcher that is not in direct communication with the projector (800-port not used).

■ Command :

Command[0]	\x33
Command[1]	\xff

■ Data :

Data[0] = source number (\x01..\x63).

Data[1] = external slot type

Data[1]	Type
\x01	Video Input
\x02	S-Video Input
\x04	RGB Analog Input - Sync On Green
\x05	RGB Analog Input - Separate Sync
\x06	RGB3S/RG3SB Input - Sync On Green
\x07	RGB3S/RG3SB Input - Separate Sync
\x08	Component Input - Sync on Y
\x09	Component Input - Separate Sync
\x0a	Component Input - Tri-Level Sync On Y
\x0b	Component Input - Tri-Level Separate Sync

Data[2] = source mode

RGB Analog Input - Separate Sync

Data[2]	Mode
\x00	H/C : Composite Sync or H/C, V : Horizontal, Vertical Sync
\x01	H/C : Composite Video

peripheral source, write

Video Input
S-Video Input
RGB Analog Input - Sync On Green
RGB3S/RG3SB Input - Separate Sync
RGB3S/RG3SB Input - Sync On Green
Component Input - Separate Sync
Component Input - Sync On Y
Component Input - Tri-Level Separate Sync
Component Input - Tri-Level Sync On Y

Data[2]	Mode
\x00	-
\x01	

■ Note :

- The external switcher has to be connected to the projector the same way a BARCO 800 peripheral is normally connected. (See the Owner's Manual of your projector)
- The source number (Data[0]) can be used to make sure the correct file is loaded.

peripheral source, write

■ Example :

Select source 1, type 'RGB Analog Input - Separate Sync', mode 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x33
Command[1]	\x80 \x7f
Data[0]	\x01
Data[1]	\x05
Data[2]	\x00
Checksum	\x39
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

phase, read

- Description :
Read the actual phase value.
- Command :

Command[0]	\x21
Command[1]	\x06

- Data :
No data bytes.
- Return data :
Data[0] = phase value
or Data[0..1] = phase value (MSB first)
- Projector type :

1 byte phase value	BD2100(LC), BD3000(LC), BD3100(LC) BD5000(LC), BD8000(LC)
2 byte phase value	others

phase, read

■ Example :

Read the actual phase value of a projector with address \x01. Suppose the phase equals \x03.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x06
Checksum	\x28
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x06
Data[0]	\x03
Checksum	\x2b
Stop	\xff

phase, write

- Description :
Write a new phase value.
- Command :

Command[0]	\x20
Command[1]	\x06

- Data :
Data[0] = phase value
or Data[0..1] = phase value (MSB first)
- Projector type :

1 byte phase value	BD2100(LC), BD3000(LC), BD3100(LC) BD5000(LC), BD8000(LC)
2 byte phase value	others

phase, write

■ Example :

Set the phase to \x03 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x06
Data[0]	\x03
Checksum	\x2a
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pip, read source

- Description :

Read the source number of the source displayed in the pip window.

- Command :

Command[0]	\x21
Command[1]	\x88

- Data :

No data bytes.

- Return data :

Data[0] = source number.

- Projector type :

The projector has to support pip.

- Example :

Read the source number of the source displayed in the pip window of a projector with address \x01. Suppose it is source 1.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x88
Checksum	\xaa
Stop	\xff

pip, read source

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x88
Data[0]	\x01
Checksum	\xab
Stop	\xff

pip, read window

■ Description :

Read the status and screen position of the pip window.

■ Command :

Command[0]	\x21
Command[1]	\x87

■ Data :

No data bytes.

■ Return data :

Data[0] = status.

Status	Data[0]
Off	\x00
On	\x01

Data[1..8] = screen position.

Data[1..8] is only returned when status is on !

Data[1,2]	x.MSB, x.LSB
Data[3,4]	y.MSB, y.LSB
Data[5,6]	w.MSB, w.LSB
Data[7,8]	h.MSB, h.LSB

where xy is top/left coordinate,
w is width and h is height of window

pip, read window

- Projector type :

The projector has to support pip.

- Example :

Read the pip window properties of a projector with address \x01. Suppose the pip window is disabled.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x87
Checksum	\xa9
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x87
Data[0]	\x00
Checksum	\xa9
Stop	\xff

pip, write source

- Description :
Select the source to be displayed in the pip window.
- Command :

Command[0]	\x20
Command[1]	\x88
- Data :
Data[0] = source number.
- Projector type :
The projector has to support pip.
- Example :
Display source 1 in the pip window of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x88
Data[0]	\x01
Checksum	\xaa
Stop	\xff

pip, write source

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pip, write window

■ Description :

Write a new position for the pip window. Also used to enable/disable the pip window.

■ Command :

Command[0]	\x20
Command[1]	\x87

■ Data :

Data[0] = status.

Status	Data[0]
Off	\x00
On	\x01

Data[1] = screen position (OPTIONAL).

Screen position	Data[1] <small>OPTIONAL</small>
Top/Left	\x00
Top/Right	\x01
Bottom/Left	\x02
Bottom/Right	\x03

or Data[1..8] = screen position (OPTIONAL).

Data[1,2]	x.MSB, x.LSB
Data[3,4]	y.MSB, y.LSB
Data[5,6]	w.MSB, w.LSB
Data[7,8]	h.MSB, h.LSB

where xy is top/left coordinate,
w is width and h is height of window

pip, write window

- Projector type :
The projector has to support pip.
- Example :
Enable the pip window on a projector with address \x01 and position it in the top/left corner of the screen.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x87
Data[0]	\x01
Data[1]	\x00
Checksum	\xa9
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixels active, decrement

■ Description :

Decrement the active number of pixels.

■ Command :

Command[0]	\x23
Command[1]	\x5d

■ Data :

No data bytes.

■ Example :

Decrement the active number of pixels on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x5d
Checksum	\x81
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixels active, increment

■ Description :

Increment the active number of pixels.

■ Command :

Command[0]	\x22
Command[1]	\x5d

■ Data :

No data bytes.

■ Example :

Increment the active number of pixels on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x5d
Checksum	\x80 \x00
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixels active, read

- Description :
Read the active number of pixels.
- Command :

Command[0]	\x21
Command[1]	\x5d

- Data :
No data bytes.
- Return data :
Data[0..1] = active number of pixels.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :
Read the active number of pixels on a projector with address \x01. Suppose the active number of pixels is 640 (\x0280).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5d
Checksum	\x7f
Stop	\xff

pixels active, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5d
Data[0]	\x02
Data[1]	\x80
	\x00
Checksum	\x01
Stop	\xff

pixels active, write

- Description :

Change the active number of pixels.

- Command :

Command[0]	\x20
Command[1]	\x5d

- Data :

Data[0..1] = active number of pixels.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the active number of pixels to 640 (\x0280) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x5d
Data[0]	\x02
Data[1]	\x80 \x00
Checksum	\x00
Stop	\xff

pixels active, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixel start, decrement

■ Description :

Decrement the value of pixel start.

■ Command :

Command[0]	\x23
Command[1]	\x5e

■ Data :

No data bytes.

■ Example :

Decrement pixel start on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x5e
Checksum	\x82
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixel start, increment

- Description :

Increment the value of pixel start.

- Command :

Command[0]	\x22
Command[1]	\x5e

- Data :

No data bytes.

- Example :

Increment pixel start on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x5e
Checksum	\x81
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixel start, read

■ Description :

Read the value of pixel start.

■ Command :

Command[0]	\x21
Command[1]	\x5e

■ Data :

No data bytes.

■ Return data :

Data[0..1] = pixel start.

Data[0]	MSB of value
Data[1]	LSB of value

■ Example :

Read the value of pixel start on a projector with address \x01. Suppose the value is 20 (\x0014).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5e
Checksum	\x80
	\x00
Stop	\xff

pixel start, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5e
Data[0]	\x00
Data[1]	\x14
Checksum	\x94
Stop	\xff

pixel start, write

- Description :
Change the value of pixel start.
- Command :

Command[0]	\x20
Command[1]	\x5e

- Data :
Data[0..1] = pixel start.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :
Set the value of pixel start to 20 (\x0014) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x5e
Data[0]	\x00
Data[1]	\x14
Checksum	\x93
Stop	\xff

pixel start, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixels total, decrement

■ Description :

Decrement the total number of pixels.

■ Command :

Command[0]	\x23
Command[1]	\x5c

■ Data :

No data bytes.

■ Example :

Decrement the total number of pixels on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x5c
Checksum	\x80 \x00
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixels total, increment

- Description :

Increment the total number of pixels.

- Command :

Command[0]	\x22
Command[1]	\x5c

- Data :

No data bytes.

- Example :

Increment the total number of pixels on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x5c
Checksum	\x7f
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

pixels total, read

- Description :
Read the total number of pixels.
- Command :

Command[0]	\x21
Command[1]	\x5c

- Data :
No data bytes.
- Return data :
Data[0..1] = total number of pixels.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :
Read the total number of pixels on a projector with address \x01. Suppose the total number of pixels is 800 (\x0320).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5c
Checksum	\x7e
Stop	\xff

pixels total, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x5c
Data[0]	\x03
Data[1]	\x20
Checksum	\xa1
Stop	\xff

pixels total, write

- Description :
Change the total number of pixels.
- Command :

Command[0]	\x20
Command[1]	\x5c

- Data :
Data[0..1] = total number of pixels.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :
Set the total number of pixels to 800 (\x0320) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x5c
Data[0]	\x03
Data[1]	\x20
Checksum	\xa0
Stop	\xff

pixels total, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

programmable blanking, write

■ Description :

Write blanking shapes (circles, rectangles, lines and triangles). (OPTIONAL)

■ Command :

Command[0]	\xe1
------------	------

■ Data :

Data for a solid circle with centre (x, y) and radius r.

	Data
Data[n]	'C' = '\x43'
Data[n+1]	x(MSB)
Data[n+2]	x(LSB)
Data[n+3]	y(MSB)
Data[n+4]	y(LSB)
Data[n+5]	r(MSB)
Data[n+6]	r(LSB)

Data for a hole circle with centre (x, y) and radius r.

	Data
Data[n]	'c' = '\x63'
Data[n+1]	x(MSB)
Data[n+2]	x(LSB)
Data[n+3]	y(MSB)
Data[n+4]	y(LSB)
Data[n+5]	r(MSB)
Data[n+6]	r(LSB)

programmable blanking, write

Data for a solid rectangle with coordinates (x1, y1) (x2, y2).

	Data
Data[n]	'R' = '\x52'
Data[n+1]	x1(MSB)
Data[n+2]	x1(LSB)
Data[n+3]	y1(MSB)
Data[n+4]	y1(LSB)
Data[n+5]	x2(MSB)
Data[n+6]	x2(LSB)
Data[n+7]	y2(MSB)
Data[n+8]	y2(LSB)

Data for a hole rectangle with coordinates (x1, y1) (x2, y2).

	Data
Data[n]	'r' = '\x72'
Data[n+1]	x1(MSB)
Data[n+2]	x1(LSB)
Data[n+3]	y1(MSB)
Data[n+4]	y1(LSB)
Data[n+5]	x2(MSB)
Data[n+6]	x2(LSB)
Data[n+7]	y2(MSB)
Data[n+8]	y2(LSB)

programmable blanking, write

Data for a solid line with coordinates (x1, y) (x2, y).

	Data
Data[n]	'L' = '\x4c'
Data[n+1]	y(MSB)
Data[n+2]	y(LSB)
Data[n+3]	x1(MSB)
Data[n+4]	x1(LSB)
Data[n+5]	x2(MSB)
Data[n+6]	x2(LSB)

Data for a hole line with coordinates (x1, y) (x2, y).

	Data
Data[n]	'1' = '\x6c'
Data[n+1]	y(MSB)
Data[n+2]	y(LSB)
Data[n+3]	x1(MSB)
Data[n+4]	x1(LSB)
Data[n+5]	x2(MSB)
Data[n+6]	x2(LSB)

programmable blanking, write

Data for a solid triangle with coordinates (x1, y1) (x2, y2) (x3, y3).

	Data
Data[n]	'T' = '\x54'
Data[n+1]	x1(MSB)
Data[n+2]	x1(LSB)
Data[n+3]	y1(MSB)
Data[n+4]	y1(LSB)
Data[n+5]	x2(MSB)
Data[n+6]	x2(LSB)
Data[n+7]	y2(MSB)
Data[n+8]	y2(LSB)
Data[n+9]	x3(MSB)
Data[n+10]	x3(LSB)
Data[n+11]	y3(MSB)
Data[n+12]	y3(LSB)

Data for a hole triangle with coordinates (x1, y1) (x2, y2) (x3, y3).

	Data
Data[n]	't' = '\x74'
Data[n+1]	x1(MSB)
Data[n+2]	x1(LSB)
Data[n+3]	y1(MSB)
Data[n+4]	y1(LSB)
Data[n+5]	x2(MSB)
Data[n+6]	x2(LSB)
Data[n+7]	y2(MSB)
Data[n+8]	y2(LSB)
Data[n+9]	x2(MSB)
Data[n+10]	x2(LSB)
Data[n+11]	y2(MSB)
Data[n+12]	y2(LSB)

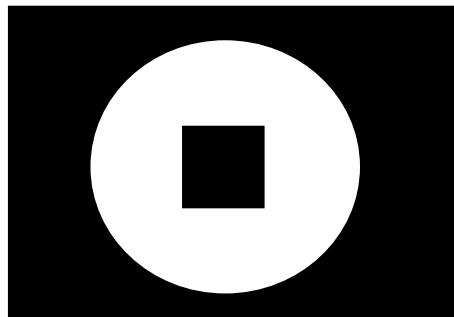
programmable blanking, write

■ Notes :

- The calculations are made starting from an imaginary solid shape as large as the lcd panel.
- To combine several shapes, just put the data of the requested shapes after each other. The order in which the shapes are drawn is the same as the order in which they are sent to the projector.
- The values of the coordinates have to be checked by the computer !!! Extreme large coordinates can lead to microprocessor reset.
- "Solid shape" means blanked inside the shape;
- "Hole shape" means no blanking inside the shape.
- The first pixel on the screen (top/left) has coordinate (0,0).

■ Example :

Draw following blanking pattern on a projector with address \x01.



- hole circle (x=350, y=250, r=200)
- solid rectangle (x1=300, y1=200, x2=400, y2=300)

programmable blanking, write

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xe1
Data[0]	\x63
Data[1]	\x01
Data[2]	\x5e
Data[3]	\x00
Data[4]	\xfa
Data[5]	\x00
Data[6]	\xc8
Data[7]	\x52
Data[8]	\x01
Data[9]	\x2c
Data[10]	\x00
Data[11]	\xc8
Data[12]	\x01
Data[13]	\x90
Data[14]	\x01
Data[15]	\x2c
Checksum	\x6b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

projector, read run time

- Description :

Read the projector run time in seconds.

- Command :

Command[0]	\x62
------------	------

- Data :

No data bytes.

- Return data :

The return data-transfer being the projector run time in seconds consists of four data bytes. The first byte is the most significant byte !

Formula :

$$\begin{aligned} \text{Projector run time (seconds)} \\ = \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3] \end{aligned}$$

- Example :

Read the projector run time of a projector with address \x01. Suppose the projector run time is 3000 hours (10800000 seconds).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x62
Checksum	\x63
Stop	\xff

projector, read run time

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x62
Data[0]	\x00
Data[1]	\xa4
Data[2]	\xcb
Data[3]	\x80
	\x00
Checksum	\x52
Stop	\xff

$$\begin{aligned} \text{projector run time} = \\ \text{\x00} * 256^3 + \text{\xa4} * 256^2 + \text{\xcb} * 256 + \text{\x80} \end{aligned}$$

projector, read serial number

- Description :

Read the serial number of the projector.

- Command :

Command[0]	\x61
------------	------

- Data :

No data bytes.

- Return data :

The return data-transfer being the projector serial number is a pascal-language string (see syntax).

- Example :

Read the serial number of a projector with address \x01.
Suppose the projector serial number is '00000001'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x61
Checksum	\x62
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

projector, read serial number

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x61
Data[0]	\x07
Data[1]	\x30 (= '0')
Data[2]	\x30 (= '0')
Data[3]	\x30 (= '0')
Data[4]	\x30 (= '0')
Data[5]	\x30 (= '0')
Data[6]	\x30 (= '0')
Data[7]	\x31 (= '1')
Checksum	\xba
Stop	\xff

projector, read type

■ Description :

Determine the type of projector you are communicating with.

■ Command :

Command[0]	\x6b
------------	------

■ Data :

No data bytes.

■ Return data :

The return data-transfer being the projector type is a pascal-language string (see syntax).

■ Example :

Read the projector type of a projector with address \x01. Suppose the projector is a 'BARCODATA 8100'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x6b
Checksum	\x6c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

projector, read type

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\xb6
Data[0]	\xe0
Data[1]	\x42 (= 'B')
Data[2]	\x41 (= 'A')
Data[3]	\x52 (= 'R')
Data[4]	\x43 (= 'C')
Data[5]	\x4f (= 'O')
Data[6]	\x44 (= 'D')
Data[7]	\x41 (= 'A')
Data[8]	\x54 (= 'T')
Data[9]	\x41 (= 'A')
Data[10]	\x20 (= ' ')
Data[11]	\x38 (= '8')
Data[12]	\x31 (= '1')
Data[13]	\x30 (= '0')
Data[14]	\x30 (= '0')
Checksum	\xe4
Stop	\xff

projector, write address

■ Description :

Write the projector address.

■ Command :

Command[0]	\x6d
------------	------

■ Data :

Data[0] = projector address.

Data[0]	\x00..\xff
---------	------------

■ Note :

The acknowledge will be sent with the original projector address.

■ Example :

Set the address of a projector with address \x01 to \x20.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x6d
Data[0]	\x20
Checksum	\x8e
Stop	\xff

projector, write address

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

sharpness, read

- Description :
Read the actual sharpness value.
- Command :

Command[0]	\x21
Command[1]	\x05

- Data :
No data bytes.
- Return data :
Data[0] = sharpness value.

Exception list

Projector Type	On screen	Data[0]
BD5000(LC), BD8000(LC)	"-4 db"	\x00
	"0 db"	\x01
	"3,5 db"	\x02
	"6 db"	\x03
BD3000(LC), BD3100(LC), BD5100(LC), BD8100(LC)	"0"	\x00
	"0.25"	\x01
	"0.5"	\x02
	"1"	\x03

sharpness, read

■ Example :

Read the actual sharpness value of a projector with address \x01. Suppose the sharpness equals \x03.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x05
Checksum	\x27
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x05
Data[0]	\x03
Checksum	\x2a
Stop	\xff

sharpness, write

- Description :
Write a new sharpness value.
- Command :

Command[0]	\x20
Command[1]	\x05

- Data :
Data[0] = sharpness value.

Exception list

Projector Type	On screen	Data[0]
BD5000(LC), BD8000(LC)	"-4 db"	\x00
	"0 db"	\x01
	"3,5 db"	\x02
	"6 db"	\x03
BD3000(LC), BD3100(LC), BD5100(LC), BD8100(LC)	"0"	\x00
	"0.25"	\x01
	"0.5"	\x02
	"1"	\x03

sharpness, write

■ Example :

Set the sharpness to \x03 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x05
Data[0]	\x03
Checksum	\x29
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shift horizontal, decrement

- Description :
Decrement the horizontal shift.
- Command :

Command[0]	\x23
Command[1]	\x47

- Data :
No data bytes.
- Example :
Decrement the horizontal shift of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x47
Checksum	\x6b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shift horizontal, increment

- Description :

Increment the horizontal shift.

- Command :

Command[0]	\x22
Command[1]	\x47

- Data :

No data bytes.

- Example :

Increment the horizontal shift of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x47
Checksum	\x6a
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shift horizontal, read

- Description :

Read the actual value of the horizontal shift.

- Command :

Command[0]	\x21
Command[1]	\x47

- Data :

No data bytes.

- Return data :

Data[0..1] = value of the horizontal shift.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of the horizontal shift of a projector with address \x01. Suppose the horizontal shift equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x47
Checksum	\x69
Stop	\xff

shift horizontal, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x47
Data[0]	\x00
Data[1]	\x00
Checksum	\x69
Stop	\xff

shift horizontal, write

- Description :

Write a new value for the horizontal shift.

- Command :

Command[0]	\x20
Command[1]	\x47

- Data :

Data[0..1] = value of the horizontal shift.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the horizontal shift to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x47
Data[0]	\x00
Data[1]	\x00
Checksum	\x68
Stop	\xff

shift horizontal, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shift vertical, decrement

- Description :
Decrement the vertical shift.
- Command :

Command[0]	\x23
Command[1]	\x48

- Data :
No data bytes.
- Example :
Decrement the vertical shift of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x48
Checksum	\x6c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shift vertical, increment

- Description :
Increment the vertical shift.
- Command :

Command[0]	\x22
Command[1]	\x48

- Data :
No data bytes.
- Example :
Increment the vertical shift of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x48
Checksum	\x6b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shift vertical, read

- Description :

Read the actual value of the vertical shift.

- Command :

Command[0]	\x21
Command[1]	\x48

- Data :

No data bytes.

- Return data :

Data[0..1] = value of the vertical shift.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of the vertical shift of a projector with address \x01. Suppose the vertical shift equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x48
Checksum	\x6a
Stop	\xff

shift vertical, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x48
Data[0]	\x00
Data[1]	\x00
Checksum	\x6a
Stop	\xff

shift vertical, write

- Description :

Write a new value for the vertical shift.

- Command :

Command[0]	\x20
Command[1]	\x48

- Data :

Data[0..1] = value of the vertical shift.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the vertical shift to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x48
Data[0]	\x00
Data[1]	\x00
Checksum	\x69
Stop	\xff

shift vertical, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

size horizontal, decrement

- Description :

Decrement the horizontal size.

- Command :

Command[0]	\x23
Command[1]	\x49

- Data :

No data bytes.

- Example :

Decrement the horizontal size of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x49
Checksum	\x6d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

size horizontal, increment

- Description :
Increment the horizontal size.
- Command :

Command[0]	\x22
Command[1]	\x49

- Data :
No data bytes.
- Example :
Increment the horizontal size of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x49
Checksum	\x6c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

size horizontal, read

- Description :

Read the actual value of the horizontal size.

- Command :

Command[0]	\x21
Command[1]	\x49

- Data :

No data bytes.

- Return data :

Data[0..1] = value of the horizontal size.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of the horizontal size of a projector with address \x01. Suppose the horizontal size equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x49
Checksum	\x6b
Stop	\xff

size horizontal, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x49
Data[0]	\x00
Data[1]	\x00
Checksum	\x6b
Stop	\xff

size horizontal, write

- Description :

Write a new value for the horizontal size.

- Command :

Command[0]	\x20
Command[1]	\x49

- Data :

Data[0..1] = value of the horizontal size.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Set the horizontal size to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x49
Data[0]	\x00
Data[1]	\x00
Checksum	\x6a
Stop	\xff

size horizontal, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

size vertical, decrement

- Description :

Decrement the vertical size.

- Command :

Command[0]	\x23
Command[1]	\x4a

- Data :

No data bytes.

- Example :

Decrement the vertical size of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x4a
Checksum	\x6e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

size vertical, increment

■ Description :

Increment the vertical size.

■ Command :

Command[0]	\x22
Command[1]	\x4a

■ Data :

No data bytes.

■ Example :

Increment the vertical size of a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x4a
Checksum	\x6d
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

size vertical, read

- Description :

Read the actual value of the vertical size.

- Command :

Command[0]	\x21
Command[1]	\x4a

- Data :

No data bytes.

- Return data :

Data[0..1] = value of the vertical size.

Data[0]	MSB of value
Data[1]	LSB of value

- Example :

Read the actual value of the vertical size of a projector with address \x01. Suppose the vertical size equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4a
Checksum	\x6c
Stop	\xff

size vertical, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x4a
Data[0]	\x00
Data[1]	\x00
Checksum	\x6c
Stop	\xff

size vertical, write

■ Description :

Write a new value for the vertical size.

■ Command :

Command[0]	\x20
Command[1]	\x4a

■ Data :

Data[0..1] = value of the vertical size.

Data[0]	MSB of value
Data[1]	LSB of value

■ Example :

Set the vertical size to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x4a
Data[0]	\x00
Data[1]	\x00
Checksum	\x6b
Stop	\xff

size vertical, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shutter, close

■ Description :

Close the mechanical shutter (OPTIONAL).

■ Command :

Command[0]	\x23
Command[1]	\x42

■ Data :

Data[0] = speed.

	Data[0]
Fast	\x00
Slow	\x01

■ Projector type :

Some projectors don't make the difference between "Fast" and "Slow" speed. However, Data[0] must always be sent.

■ Example :

Close the shutter (full speed) of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x42
Data[0]	\x00
Checksum	\x66
Stop	\xff

shutter, close

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shutter, open

■ Description :

Open the mechanical shutter (OPTIONAL).

■ Command :

Command[0]	\x22
Command[1]	\x42

■ Data :

Data[0] = speed.

	Data[0]
Fast	\x00
Slow	\x01

■ Projector type :

Some projectors don't make the difference between "Fast" and "Slow" speed. However, Data[0] must always be sent.

■ Example :

Open the shutter (full speed) of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x42
Data[0]	\x00
Checksum	\x65
Stop	\xff

shutter, open

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

shutter, read

- Description :

Read the actual shutter position (OPTIONAL).

- Command :

Command[0]	\x21
Command[1]	\x42

- Data :

No data bytes.

- Return data :

Data[0] = shutter position.

	Data[0]
Closed	\x00
Open	\x01
Undetermined	\x02

- Projector type :

Some projectors cannot determine whether the shutter is "Open" or "Closed". These projectors always return "Undetermined".

- Example :

Read the actual shutter position of a projector with address \x01. Suppose the shutter is open.

shutter, read

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x42
Checksum	\x64
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x42
Data[0]	\x01
Checksum	\x65
Stop	\xff

soft edge, read status

- Description :

Read the status (on/off) of the soft edge.

- Command :

Command[0]	\x21
Command[1]	\x82

- Data :

No data bytes.

- Return data :

Data[0] = status.

Status	Data[0]
Off	\x00
On	\x01

- Projector type :

All projectors equipped with soft edge, except simulation products.

soft edge, read status

■ Example :

Read the status of the soft edge of a projector with address \x01. Suppose the soft edge is turned on.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x82
Checksum	\xa4
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x82
Data[0]	\x01
Checksum	\xa5
Stop	\xff

soft edge, write status

- Description :
Set the soft edge on or off.
- Command :

Command[0]	\x20
Command[1]	\x82

- Data :
Data[0] = Status

Status	Data[0]
Off	\x00
On	\x01

- Projector type :
All projectors equipped with soft edge, except simulation products.

soft edge, write status

■ Example :

Set the soft edge on of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x82
Data[0]	\x01
Checksum	\xa4
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

soft edge black level, decrement

- Description :

Decrement the soft edge black level.

- Command :

Command[0]	\x23
Command[1]	\x84
Command[2]	\x00 in case of red black level \x01 in case of green black level \x02 in case of blue black level

- Data :

No data bytes.

- Projector type :

All projectors equipped with soft edge, except simulation products.

- Example :

Decrement the red soft edge black level on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x84
Command[2]	\x00
Checksum	\xa8
Stop	\xff

soft edge black level, decrement

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

soft edge black level, increment

- Description :

Increment the soft edge black level.

- Command :

Command[0]	\x22
Command[1]	\x84
Command[2]	\x00 in case of red black level \x01 in case of green black level \x02 in case of blue black level

- Data :

No data bytes.

- Projector type :

All projectors equipped with soft edge, except simulation products.

- Example :

Increment the red soft edge black level on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x84
Command[2]	\x00
Checksum	\xa7
Stop	\xff

soft edge black level, increment

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

soft edge black level, read

- Description :
Read the value of the soft edge black level.
- Command :

Command[0]	\x21
Command[1]	\x84
Command[2]	\x00 in case of red black level \x01 in case of green black level \x02 in case of blue black level

- Data :
No data bytes.
- Return data :
Data[0] = soft edge black level.
- Projector type :
All projectors equipped with soft edge, except simulation products.

soft edge black level, read

■ Example :

Read the value of red soft edge black level on a projector with address \x01. Suppose the value is 100 (\x64).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x84
Command[2]	\x00
Checksum	\xa6
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x84
Command[2]	\x00
Data[0]	\x64
Checksum	\x0a
Stop	\xff

soft edge black level, write

- Description :

Change the value of the black level.

- Command :

Command[0]	\x20
Command[1]	\x84
Command[2]	\x00 in case of red black level \x01 in case of green black level \x02 in case of blue black level

- Data :

Data[0] = soft edge black level.

- Projector type :

All projectors equipped with soft edge, except simulation products.

- Example :

Set the value of red soft edge black level to 100 (\x64) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x84
Command[2]	\x00
Data[0]	\x64
Checksum	\x09
Stop	\xff

soft edge black level, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

soft edge size, decrement

- Description :

Decrement the top, bottom left or right soft edge size.

- Command :

Command[0]	\x23
Command[1]	\x83
Command[2]	\x00 in case of top size \x01 in case of bottom size \x02 in case of left size \x03 in case of right size

- Data :

No data bytes.

- Projector type :

All projectors equipped with soft edge, except simulation products.

- Example :

Decrement the soft edge left size on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x83
Command[2]	\x02
Checksum	\xa9
Stop	\xff

soft edge size, decrement

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

soft edge size, increment

- Description :

Increment the top, bottom left or right soft edge size.

- Command :

Command[0]	\x22
Command[1]	\x83
Command[2]	\x00 in case of top size \x01 in case of bottom size \x02 in case of left size \x03 in case of right size

- Data :

No data bytes.

- Projector type :

All projectors equipped with soft edge, except simulation products.

- Example :

Increment the soft edge left size on a projector with address \x01 by one.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x83
Command[2]	\x02
Checksum	\xa8
Stop	\xff

soft edge size, increment

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

soft edge size, read

- Description :

Read the value of the top, bottom, left or right soft edge size.

- Command :

Command[0]	\x21
Command[1]	\x83
Command[2]	\x00 in case of top size \x01 in case of bottom size \x02 in case of left size \x03 in case of right size

- Data :

No data bytes.

- Return data :

Data[0] = soft edge size.

- Projector type :

All projectors equipped with soft edge, except simulation products.

soft edge size, read

■ Example :

Read the value of left soft edge size on a projector with address \x01. Suppose the value is 100 (\x64).

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x83
Command[2]	\x02
Checksum	\xa7
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x83
Command[2]	\x02
Data[0]	\x64
Checksum	\x0b
Stop	\xff

soft edge size, write

- Description :

Change the value of the top, bottom, left or right soft edge size.

- Command :

Command[0]	\x20
Command[1]	\x83
Command[2]	\x00 in case of top size \x01 in case of bottom size \x02 in case of left size \x03 in case of right size

- Data :

Data[0] = soft edge size.

- Projector type :

All projectors equipped with soft edge, except simulation products.

- Example :

Set the value of left soft edge size to 100 (\x64) on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x83
Command[2]	\x02
Data[0]	\x64
Checksum	\x0a
Stop	\xff

soft edge size, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

software, read language

- Description :

Read the language used in the on-screen-display.

- Command :

Command[0]	\x69
------------	------

- Data :

No data bytes.

- Return data :

The return data-transfer being the software language is a pascal-language string (see syntax).

- Example :

Read the on-screen-display language of a projector with address \x01. Suppose the lanuage is 'ENGLISH'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x69
Checksum	\x6a
Stop	\xff

software, read language

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x69
Data[0]	\x07
Data[1]	\x45 (= 'E')
Data[2]	\x4e (= 'N')
Data[3]	\x47 (= 'G')
Data[4]	\x4c (= 'L')
Data[5]	\x49 (= 'I')
Data[6]	\x53 (= 'S')
Data[7]	\x48 (= 'H')
Checksum	\x7b
Stop	\xff

software, read type

- Description :
Read the type of software installed in the projector.
- Command :

Command[0]	\x6a
------------	------
- Data :
No data bytes.
- Return data :
The return data-transfer being the software type is a pascal-language string (see syntax).
- Example :
Read the software type of a projector with address \x01.
Suppose the language is 'STANDARD'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x6a
Checksum	\x6b
Stop	\xff

software, read type

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x6a
Data[0]	\x08
Data[1]	\x53 (= 'S')
Data[2]	\x54 (= 'T')
Data[3]	\x41 (= 'A')
Data[4]	\x4e (= 'N')
Data[5]	\x44 (= 'D')
Data[6]	\x41 (= 'A')
Data[7]	\x52 (= 'R')
Data[8]	\x44 (= 'D')
Checksum	\xc4
Stop	\xff

software, read version

■ Description :

Read the version of the software.

■ Command :

Command[0]	\x60
------------	------

■ Data :

No data bytes.

■ Return data :

The return data-transfer being the software version is a pascal-language string (see syntax).

■ Example :

Read the software version of a projector with address \x01. Suppose the version number is '1.02'.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x60
Checksum	\x61
Stop	\xff

software, read version

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x60
Data[0]	\x04
Data[1]	\x31 (= '1')
Data[2]	\x2e (= ':')
Data[3]	\x30 (= '0')
Data[4]	\x32 (= '2')
Checksum	\x26
Stop	\xff

source/slot, read number+mode

- Description :

Read active source or slot number and its mode.

- Command :

Command[0]	\x34
------------	------

- Data :

No data bytes.

- Return data :

Data[0] = source or slot number (\x01..).

source/slot, read number+mode

Data[1] = source or slot mode

Video/S-Video Input

Data[1]	Mode
\x00	Video
\x01	S-Video

RGB Analog Input - Separate Sync

Data[1]	Mode
\x00	H/C : Composite Sync or H/C, V : Horizontal, Vertical Sync
\x01	H/C : Composite Video

Fixed 5-Cable Input

Data[1]	Mode
\x00	RGB Analog – Separate Sync H/C : Composite Sync or H/C, V : Horizontal, Vertical Sync
\x01	RGB Analog – Separate Sync H/C : Composite Video or H/C : 3 Level Composite Sync
\x02	RGB Analog – Sync on Green G : Green + Sync or G : Green + 3 Level Sync
\x03	Component Video – Separate Sync Cs : Sync or Cs : 3 Level Sync
\x04	Component Video – Sync on Y Y : Y + Sync or Y : Y + 3 Level Sync
\x05	Video
\x06	S-Video

source/slot, read number+mode

Digital Video Decoder Input

Data[1]	Mode
\x00	Video
\x01	S-Video
\x02	YUV

RGB Analog Input - Sync On Green

RGB3S/RG3SB Input - Separate Sync

RGB3S/RG3SB Input - Sync On Green

Component Input - Separate Sync

Component Input - Sync On Y

Component Input - Tri-Level Separate Sync

Component Input - Tri-Level Sync On Y

Data[1]	Mode
\x00	-
\x01	

source/slot, read number+mode

■ Example :

Read the active source/slot number+mode of a projector with address \x01. Suppose the source number equals \x03 and its mode equals \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x34
Checksum	\x35
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x34
Data[0]	\x03
Data[1]	\x01
Checksum	\x39
Stop	\xff

source/slot, write number+mode

- Description :

Select a source or slot and put it in a pre-defined mode
(mode selection is optional).

- Command :

Command[0]	\x33
------------	------

- Data :

Data[0] = source or slot number (\x01..).

source/slot, write number+mode

Data[1] = source or slot mode OPTIONAL

Video/S-Video Input

Data[1]	Mode
\x00	Video
\x01	S-Video

RGB Analog Input - Separate Sync

Data[1]	Mode
\x00	H/C : Composite Sync or H/C, V : Horizontal, Vertical Sync
\x01	H/C : Composite Video

Fixed 5-Cable Input + DVI

Data[1]	Mode
\x00	RGB Analog – Separate Sync H/C : Composite Sync or H/C, V : Horizontal, Vertical Sync
\x01	RGB Analog – Separate Sync H/C : Composite Video or H/C : 3 Level Composite Sync
\x02	RGB Analog – Sync on Green G : Green + Sync or G : Green + 3 Level Sync
\x03	Component Video – Separate Sync Cs : Sync or Cs : 3 Level Sync
\x04	Component Video – Sync on Y Y : Y + Sync or Y : Y + 3 Level Sync
\x05	Video
\x06	S-Video
\x07	DVI

source/slot, write number+mode

Digital Video Decoder Input

Data[1]	Mode
\x00	Video
\x01	S-Video
\x02	YUV

RGB Analog Input - Sync On Green

RGB3S/RG3SB Input - Separate Sync

RGB3S/RG3SB Input - Sync On Green

Component Input - Separate Sync

Component Input - Sync On Y

Component Input - Tri-Level Separate Sync

Component Input - Tri-Level Sync On Y

Data[1]	Mode
\x00	-
\x01	

Remark : If only one data byte has been sent (Data[0]), the slot will be selected in its previous mode.

source/slot, write number+mode

■ Example :

Select source 1, mode 1 of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x33
Data[0]	\x01
Data[1]	\x01
Checksum	\x36
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

sync, read

- Description :

Read slow/fast sync (only active when the decoder is used).

- Command :

Command[0]	\x21
Command[1]	\x27

- Data :

No data bytes.

- Return data :

Data[0] = sync.

Sync	Data[0]
Slow	\x00
Fast	\x04

- Projector type :

BD2100(LC), BD3000(LC), BD3100(LC), BD5100(LC),
BD8100(LC), BG8100(LC)..

sync, read

■ Example :

Read the sync status of a projector with address \x01.
Suppose the sync status equals fast.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x27
Checksum	\x49
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x27
Data[0]	\x04
Checksum	\x4d
Stop	\xff

sync, write fast

■ Description :

Set the sync to fast (only active when the decoder is used).

■ Command :

Command[0]	\x27
Command[1]	\x27

■ Data :

No data bytes.

■ Projector type :

BD2100(LC), BD3000(LC), BD3100(LC), BD5100(LC),
BD8100(LC), BG8100(LC)..

■ Example :

Set the sync to fast of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x27
Checksum	\x4f
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

sync, write slow

■ Description :

Set the sync to slow (only active when the decoder is used).

■ Command :

Command[0]	\x26
Command[1]	\x27

■ Data :

No data bytes.

■ Projector type :

BD2100(LC), BD3000(LC), BD3100(LC), BD5100(LC),
BD8100(LC), BG8100(LC)..

■ Example :

Set the sync to slow of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x27
Checksum	\x4e
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

text, write off

■ Description :

Set text off (identical to TEXT button on infrared remote control).

■ Command :

Command[0]	\x0e
------------	------

■ Data :

No data bytes.

■ Example :

Set text off of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x0e
Checksum	\x0f
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

text, write on

■ Description :

Set text on (identical to TEXT button on infrared remote control).

■ Command :

Command[0]	\x0d
------------	------

■ Data :

No data bytes.

■ Example :

Set text on of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x0d
Checksum	\xe0
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

tint, read

- Description :

Read the actual tint value.
(only active when the internal decoder is used and the signal is NTSC).

- Command :

Command[0]	\x21
Command[1]	\x04

- Data :

No data bytes.

- Return data :

Data[0] = tint value.

- Note :

This command is only active when the internal decoder is used and the signal is NTSC.

- Example :

Read the actual tint value of a projector with address \x01.
Suppose the tint equals 0.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x04
Checksum	\x26
Stop	\xff

tint, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x04
Data[0]	\x00
Checksum	\x26
Stop	\xff

tint, write

- Description :
Write a new tint value.
- Command :

Command[0]	\x20
Command[1]	\x04

- Data :
Data[0] = tint value.
- Note :
This command is only active when the internal decoder is used and the signal is NTSC.
- Example :
Set the tint to 0 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x04
Data[0]	\x00
Checksum	\x25
Stop	\xff

tint, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

treble, read

- Description :
Read the actual treble value.
- Command :

Command[0]	\x21
Command[1]	\x09

- Data :
No data bytes.
- Return data :
Data[0] = treble value.
- Projector type :
All projectors with audio control.
- Example :
Read the actual treble value of a projector with address \x01. Suppose the volume equals \xff.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x09
Checksum	\x2b
Stop	\xff

treble, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x09
Data[0]	\x80 \x7f
Checksum	\x2a
Stop	\xff

treble, write

- Description :
Write a new treble value.
- Command :

Command[0]	\x20
Command[1]	\x09

- Data :
Data[0] = treble value.
- Projector type :
All projectors with audio control.
- Example :
Set the treble to \xff on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x09
Data[0]	\x80 \x7f
Checksum	\x29
Stop	\xff

treble, write

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

vertical refresh, read

- Description :

Read the actual value of the vertical refresh.

- Command :

Command[0]	\x21
Command[1]	\x61

- Data :

No data bytes.

- Return data :

Data[0] = value of the vertical refresh.

	Data[0]
Sync	\x00
Async	\x01

- Example :

Read the actual value of the vertical refresh of a projector with address \x01. Suppose the vertical refresh is synchronous.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x61
Checksum	\x83
Stop	\xff

vertical refresh, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x61
Data[0]	\x00
Checksum	\x83
Stop	\xff

vertical refresh, write synchronous

■ Description :

Set the vertical refresh to synchronous.

■ Command :

Command[0]	\x26
Command[1]	\x61

■ Data :

No data bytes.

■ Example :

Set the vertical refresh to synchronous on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x61
Checksum	\x88
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

vertical refresh, write asynchronous

■ Description :

Set the vertical refresh to asynchronous.

■ Command :

Command[0]	\x27
Command[1]	\x61

■ Data :

No data bytes.

■ Example :

Set the vertical refresh to asynchronous on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x61
Checksum	\x89
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

vertical sync polarity, read

■ Description :

Read the actual value of the vertical sync polarity.

■ Command :

Command[0]	\x21
Command[1]	\x64

■ Data :

No data bytes.

■ Return data :

Data[0] = value of the vertical sync polarity.

	Data[0]
Leading	\x00
Trailing	\x01

■ Example :

Read the actual value of the vertical sync polarity of a projector with address \x01. Suppose the vertical sync polarity is leading.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x64
Checksum	\x86
Stop	\xff

vertical sync polarity, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x64
Data[0]	\x00
Checksum	\x86
Stop	\xff

vertical sync polarity, write leading

■ Description :

Set the vertical sync polarity to leading.

■ Command :

Command[0]	\x26
Command[1]	\x64

■ Data :

No data bytes.

■ Example :

Set the vertical sync polarity to leading on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x26
Command[1]	\x64
Checksum	\x8b
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

vertical sync polarity, write trailing

■ Description :

Set the vertical sync polarity to trailing.

■ Command :

Command[0]	\x27
Command[1]	\x64

■ Data :

No data bytes.

■ Example :

Set the vertical sync polarity to trailing on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x27
Command[1]	\x64
Checksum	\x8c
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

volume, read

- Description :
Read the actual volume value.
- Command :

Command[0]	\x21
Command[1]	\x07

- Data :
No data bytes.
- Return data :
Data[0] = volume value.
- Example :
Read the actual volume value of a projector with address \x01. Suppose the volume equals \x10.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x07
Checksum	\x29
Stop	\xff

volume, read

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x07
Data[0]	\x10
Checksum	\x39
Stop	\xff

volume, write

- Description :
Write a new volume value.
- Command :

Command[0]	\x20
Command[1]	\x07

- Data :
Data[0] = volume value.
- Example :
Set the volume to \x10 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x07
Data[0]	\x10
Checksum	\x38
Stop	\xff

Receive (acknowledge)	
Start	\xfe
Projector address	\x01
Command[0]	\x00
Command[1]	\x06
Checksum	\x07
Stop	\xff

Appendix : Command summary

appendix : command summary

2 line LCD, read : \x7a\x01
2 line LCD, read backlight : \x7a\x04
2 line LCD, read cursor : \x7a\x03
2 line LCD, read format : \x7a\x06
2 line LCD, read text : \x7a\x02
2 line LCD, write backlight : \x7a\x84[value]
2 line LCD, write clear : \x7a\x85
2 line LCD, write cursor : \x7a\x83[x][y][status][blink]
2 line LCD, write text : \x7a\x82[text]
800-peripheral, read output module : \xf2\x81[config]
800-peripheral, write output module : \xf2\x01[config]

appendix : command summary

balance, decrement : \x23\x0a
balance, increment : \x22\x0a
balance, read : \x21\x0a
balance, write : \x20\x0a[value]
bass, decrement : \x23\x08
bass, increment : \x22\x08
bass, read : \x21\x08
bass, write : \x20\x08[value]
baudrate pc, write : \x75[baudrate]
blanking bottom, decrement : \x23\x4d
blanking bottom, increment : \x22\x4d
blanking bottom, read : \x21\x4d
blanking bottom, write : \x20\x4d[value]
blanking left, decrement : \x23\x4e
blanking left, increment : \x22\x4e
blanking left, read : \x21\x4e
blanking left, write : \x20\x4e[value]
blanking right, decrement : \x23\x4f
blanking right, increment : \x22\x4f
blanking right, read : \x21\x4f
blanking right, write : \x20\x4f[value]
blanking top, decrement : \x23\x4c
blanking top, increment : \x22\x4c
blanking top, read : \x21\x4c
blanking top, write : \x20\x4c[value]
brightness, decrement : \x04
brightness, increment : \x03
brightness, read : \x21\x02
brightness, write : \x20\x02[value]

appendix : command summary

clamp delay, decrement : \x23\x67
clamp delay, increment : \x22\x67
clamp delay, read : \x21\x67
clamp delay, write : \x20\x67[value]
clamp edge, read : \x21\x66
clamp edge, write leading : \x26\x66
clamp edge, write trailing : \x27\x66
clamp width, decrement : \x23\x68
clamp width, increment : \x22\x68
clamp width, read : \x21\x68
clamp width, write : \x20\x68[value]
color balance blue/green, decrement : \x23\x44
color balance blue/green, increment : \x22\x44
color balance blue/green, read : \x21\x44
color balance blue/green, write : \x20\x44[value]
color balance red/green, decrement : \x23\x43
color balance red/green, increment : \x22\x43
color balance red/green, read : \x21\x43
color balance red/green, write : \x20\x43[value]
color temperature, read : \x21\x45
color temperature, write : \x20\x45[value]
color, decrement : \x06
color, increment : \x05
color, read : \x21\x03
color, write : \x20\x03[value]
contrast, decrement : \x02
contrast, increment : \x01
contrast, read : \x21\x01
contrast, write : \x20\x01[value]

appendix : command summary

dimming, decrement : \x23\x0d
dimming, increment : \x22\x0d
dimming, read : \x21\x0d
fade audio extern, decrement : \x23\x41
fade audio extern, increment : \x22\x41
fade audio extern, read : \x21\x41
fade audio extern, write : \x20\x41[value]
fade audio intern, decrement : \x23\x40
fade audio intern, increment : \x22\x40
fade audio intern, read : \x21\x40
fade audio intern, write : \x20\x40[value]
field polarity, read : \x21\x62
field polarity, write : \x20\x62[value]
field select, read : \x21\x63
field select, write : \x20\x63[value]
file, copy : \xc2[filename1][filename2]
file, delete : \xc1[filename]
file, list : \xc0[filename]
file, list active : \xc5
file, load : \xbd\x82[filename]
file, move : \xc4[filename1][filename2]
file, read : \xbf[filename]
file, rename : \xc3[filename1][filename2]
file, write : \be[filename][data]
frame delay, read : \x21\x65
frame delay, write off : \x26\x65
frame delay, write on : \x27\x65
freeze, write off : \x26\x23
freeze, write on : \x27\x23

appendix : command summary

gamma, decrement : \x23\x70
gamma, increment : \x22\x70
gamma, read : \x21\x70
gamma, write : \x20\x70[value]
horizontal period, read : \x21\x5b
horizontal period, write : \x20\x5b[value]

appendix : command summary

information display, read : \x73
infrared control, * : \x30\x77
infrared control, 0 : \x30\x19
infrared control, 1 : \x30\x10
infrared control, 2 : \x30\x11
infrared control, 3 : \x30\x12
infrared control, 4 : \x30\x13
infrared control, 5 : \x30\x14
infrared control, 6 : \x30\x15
infrared control, 7 : \x30\x16
infrared control, 8 : \x30\x17
infrared control, 9 : \x30\x18
infrared control, ADDR : \x30\x20
infrared control, ADJUST : \x30\x09
infrared control, ARROW DOWN : \x30\x05
infrared control, ARROW DOWN : \x30\x05
infrared control, ARROW LEFT : \x30\x07
infrared control, ARROW RIGHT : \x30\x06
infrared control, ARROW UP : \x30\x04
infrared control, BALANCE- : \x30\x3f
infrared control, BALANCE+ : \x30\x3e
infrared control, BASS- : \x30\x3b
infrared control, BASS+ : \x30\x3a
infrared control, BRIGHTNESS- : \x30\x2b
infrared control, BRIGHTNESS : \x30\x27
infrared control, BRIGHTNESS+ : \x30\x2a
infrared control, COLOR- : \x30\x2d
infrared control, COLOR : \x30\x30
infrared control, COLOR+ : \x30\x2c
infrared control, CONTRAST : \x30\x25
infrared control, CONTRAST- : \x30\x29
infrared control, CONTRAST+ : \x30\x28
infrared control, ENTER : \x30\x0a

appendix : command summary

infrared control, EXIT : \x30\x08
infrared control, FREEZ : \x30\x1b
infrared control, F1 : \x30\x6b
infrared control, F2 : \x30\x6c
infrared control, F3 : \x30\x6d
infrared control, F4 : \x30\x6e
infrared control, F5 : \x30\x6f
infrared control, HELP : \x30\x1e
infrared control, MUTE : \x30\x1f
infrared control, PAUSE : \x30\x0f
infrared control, PHASE : \x30\x32
infrared control, PHASE- : \x30\x35
infrared control, PHASE+ : \x30\x34
infrared control, SHARPNESS : \x30\x33
infrared control, SHARPNESS- : \x30\x37
infrared control, SHARPNESS+ : \x30\x36
infrared control, STDBY : \x30\x0e
infrared control, TEXT : \x30\x0d
infrared control, TINT- : \x30\x2f
infrared control, TINT : \x30\x31
infrared control, TINT+ : \x30\x2e
infrared control, TREBLE- : \x30\x3d
infrared control, TREBLE+ : \x30\x3c
infrared control, VOLUME- : \x30\x39
infrared control, VOLUME+ : \x30\x38
infrared ports, read : \x6f
infrared ports, write : \x6e[value]
installation, read : \x21\x24
installation, write : \x20\x24
interlace, write on : \x27\x60
interlaced, read : \x21\x60
interlaced, write off : \x26\x60
internal pattern, write : \x41[value]

appendix : command summary

keystone horizontal, decrement : \x23\x50
keystone horizontal, increment : \x22\x50
keystone horizontal, read : \x21\x50
keystone horizontal, write : \x20\x50[value]
lamp, read article number : \x76\x84
lamp, read CLO status : \x76\x96
lamp, read history : \x74
lamp, read maximum run time : \x76\x89
lamp, read message run time : \x76\x8b
lamp, read run time : \x64
lamp, read serial number (1) : \x63
lamp, read serial number (2) : \x76\x86
lamp, read status : \x6c
lamp, read strikes : \x76\x8e
lamp, read warning run time : \x76\x8c
lamp, reset run time : \x68
lamp, write CLO status : \x76\x16
lamp, write status : \xc6
language, read : \x71
language, write : \x70[language]
lens, bridge : \xf4\x85[direction]
lens, focus : \xf4\x83[direction]
lens, shift : \xf4\x81[direction]
lens, tilt : \xf4\x84[direction]
lens, zoom : \xf4\x82[direction]

appendix : command summary

line start, decrement : \x23\x5a
line start, increment : \x22\x5a
line start, read : \x21\x5a
line start, write : \x20\x5a[value]
lines active, decrement : \x23\x59
lines active, increment : \x22\x59
lines active, read : \x21\x59
lines active, write : \x20\x59
lines total, decrement : \x23\x58
lines total, increment : \x22\x58
lines total, read : \x21\x58
lines total, write : \x20\x58
lock audio, read : \x21\x3f
lock audio, read : \x21\x3f
lock audio, write : \x20\x3f[lock]
logo, read background : \xf1\x82
logo, read hot-key : \xf1\x83
logo, read position : \xf1\x84
logo, read status : \xf1\x81
logo, write background : \xf1\x02[value]
logo, write hot-key : \xf1\x03[value]
logo, write position : \xf1\x04[value]
logo, write status : \xf1\x01[value]

appendix : command summary

menu, exit : \x42\x01\x01
menu, exit all : \x42\x01\xff
MOCA, read version : \xf3\x82
MOCA, set blue to midposition : \xf3\x06
MOCA, set green to midposition : \xf3\x04
MOCA, set red to midposition : \xf3\x05
MOCA, set to midposition : \xf3\x07
MOCA, write blue : \xf3\x03[position][direction]
MOCA, write green : \xf3\x01[position][direction]
MOCA, write red : \xf3\x02[position][direction]
mute audio, read : \x21\x3d
mute audio, write off : \x26\x3d
mute audio, write on : \x27\x3d
mute video, read : \x21\x3e
mute video, write off : \x26\x3e
mute video, write on : \x27\x3e
overlay palette, write : \x0f[entry][values]

appendix : command summary

panel, read size : \xf0\x01
peripheral source, write : \x33\xff[source][type]
phase, decrement : \x0c
phase, increment : \x0b
phase, read : \x21\x06
phase, write : \x20\x06[value]
pip, read source : \x21\x88
pip, read window : \x21\x87
pip, write source : \x20\x88[source]
pip, write window : \x20\x87[status][position]
pixel start, decrement : \x23\x5e
pixel start, increment : \x22\x5e
pixel start, read : \x21\x5e
pixel start, write : \x20\x5e[value]
pixels active, decrement : \x23\x5d
pixels active, increment : \x22\x5d
pixels active, read : \x21\x5d
pixels active, write : \x20\x5d[value]
pixels total, decrement : \x23\x5c
pixels total, increment : \x22\x5c
pixels total, read : \x21\x5c
pixels total, write : \x20\x5c[value]
programmable blanking, write : \xe1[shape]
projector status, read : \x67
projector status, write off : \x66
projector status, write on : \x65
projector, read run time : \x62
projector, read serial number : \x61
projector, read type : \x6b
projector, write address : \x6d[address]

appendix : command summary

sharpness, decrement : \x0a
sharpness, increment : \x09
sharpness, read : \x21\x05
sharpness, write : \x20\x05[value]
shift horizontal, decrement : \x23\x47
shift horizontal, increment : \x22\x47
shift horizontal, read : \x21\x47
shift horizontal, write : \x20\x47[value]
shift vertical, decrement : \x23\x48
shift vertical, increment : \x22\x48
shift vertical, read : \x21\x48
shift vertical, write : \x20\x48[value]
shutter, close : \x23\x42[speed]
shutter, open : \x22\x42[speed]
shutter, read : \x21\x42
size horizontal, decrement : \x23\x49
size horizontal, increment : \x22\x49
size horizontal, read : \x21\x49
size horizontal, write : \x20\x49[value]
size vertical, decrement : \x23\x4a
size vertical, increment : \x22\x4a
size vertical, read : \x21\x4a
size vertical, write : \x20\x4a[value]

appendix : command summary

soft edge (scenergix), read status : \x21\x82
soft edge, write status : \x20\x82
soft edge black level blue, decrement : \x23\x84\x02
soft edge black level green, decrement : \x23\x84\x01
soft edge black level red, decrement : \x23\x84\x00
soft edge black level blue, increment : \x22\x84\x02
soft edge black level green, increment : \x22\x84\x01
soft edge black level red, increment : \x22\x84\x00
soft edge black level blue, read : \x21\x84\x02
soft edge black level green, read : \x21\x84\x01
soft edge black level red, read : \x21\x84\x00
soft edge black level blue, write : \x20\x84\x02[value]
soft edge black level green, write : \x20\x84\x01[value]
soft edge black level red, write : \x20\x84\x00[value]
soft edge size bottom, decrement : \x23\x83\x01
soft edge size left, decrement : \x23\x83\x02
soft edge size right, decrement : \x23\x83\x03
soft edge size top, decrement : \x23\x83\x00
soft edge size bottom, increment : \x22\x83\x01
soft edge size left, increment : \x22\x83\x02
soft edge size right, increment : \x22\x83\x03
soft edge size top, increment : \x22\x83\x00
soft edge size bottom, read : \x21\x83\x01
soft edge size left, read : \x21\x83\x02
soft edge size right, read : \x21\x83\x03
soft edge size top, read : \x21\x83\x00
soft edge size bottom, write : \x20\x83\x01[value]
soft edge size left, write: \x20\x83\x02[value]
soft edge size right, write: \x20\x83\x03[value]
soft edge size top, write: \x20\x83\x00[value]

appendix : command summary

software, read language : \x69
software, read type : \x6a
software, read version : \x60
source/slot, read number : \x32
source/slot, read number+mode : \x34
source/slot, read number+mode : \x34
source/slot, write number : \x31\x[source/slot number]
source/slot, write number+mode : \x33[source/slot
number][source/slot mode]
source/slot, write number+mode : \x33[source][mode]
sync, read : \x21\x27
sync, write fast : \x27\x27
sync, write slow : \x26\x27
text, write off : \x0e
text, write on : \x0d
tint, decrement : \x08
tint, increment : \x07
tint, read : \x21\x04
tint, write : \x20\x04[value]
treble, decrement : \x23\x09
treble, increment : \x22\x09
treble, read : \x21\x09
treble, write : \x20\x09[value]
vertical refresh, read : \x21\x61
vertical refresh, write asynchronous : \x26\x61
vertical refresh, write synchronous : \x27\x61
vertical sync polarity, read : \x21\x64
vertical sync polarity, write leading : \x26\x64
vertical sync polarity, write trailing : \x27\x64
volume, decrement : \x23\x07
volume, increment : \x22\x07
volume, read : \x21\x07
volume, write : \x20\x07[value]