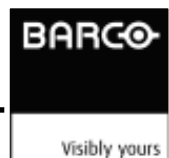


# SERIAL COMMUNICATION LCD-DLP PROJECTOR USERS MANUAL

R5975236  
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# 1. Communication basics



## communication protocol

Communication protocol summary

Start byte	\xfe
Projector address	
Command byte(s)	
Data bytes <sup>(OPTIONAL)</sup>	
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<sup>(OPTIONAL)</sup>:

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:

Checksum byte

= (Projector address + Command bytes + Data bytes) modulo 256

### ■ 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.

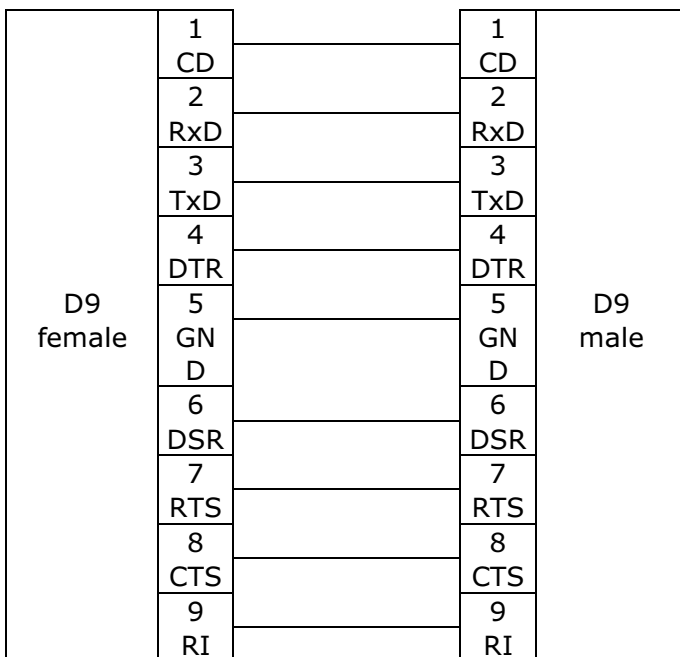


## hardware

- 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:

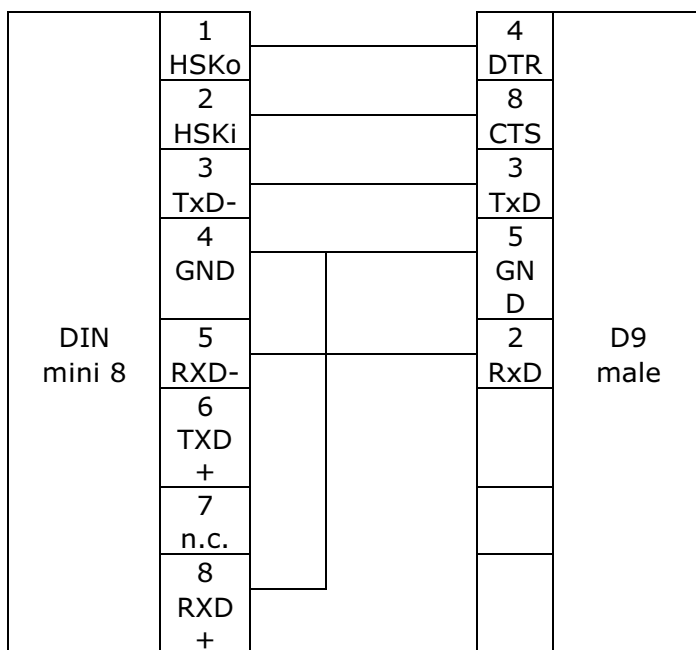
Pin #	Name	Full name
1	CD	Carrier Detect
2	RxD	Received Data
3	TxD	Transmitted Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

- Cable (IBM PC or compatible ⇔ projector):



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

■ 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

- 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	<i>\xhh</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	<i>\x0b</i>
'h'	<i>\x68</i>
'e'	<i>\x65</i>
'l'	<i>\x6c</i>
'l'	<i>\x6c</i>
'o'	<i>\x6f</i>
' '	<i>\x20</i>
'w'	<i>\x77</i>
'o'	<i>\x6f</i>
'r'	<i>\x72</i>
'l'	<i>\x6c</i>
'd'	<i>\x64</i>

- 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'	<i>\x68</i>
'e'	<i>\x65</i>
'l'	<i>\x6c</i>
'l'	<i>\x6c</i>
'o'	<i>\x6f</i>
' '	<i>\x20</i>
'w'	<i>\x77</i>
'o'	<i>\x6f</i>
'r'	<i>\x72</i>
'l'	<i>\x6c</i>
'd'	<i>\x64</i>
NULL	<i>\x00</i>

■ Multi-byte value:

A multi-byte value consists of more than one byte. The first byte is the MSB (see abbreviations).

Example for a 4-byte value:

$$\backslashx01\backslashx20\backslashx50\backslashx30 = \backslashx01*256^3 + \backslashx20*256^2 + \backslashx50*256 + \backslashx30 = 536956976$$

■ Filename:

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



- 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'	'0'	'1'	'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.

## 2. 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



## **answer**

- Description:

Each command can be preceded with the answer command. This will be ignored when the command is a read operation (read operations always return an answer).

- Command:

Command[0]	\x00
Command[1]	\x03

- Data:

Data[0]		
bit0	= 0	
bit1	= 1	return with "success" or "no success" after the command has been executed
bit2	= 0	
bit3	= 0	
bit4	= 0	
bit5	= 0	
bit6	= 0	
bit7	= 0	

- Return data for success:

Command[0]	\x00
Command[1]	\x03
Data[0]	\x01

- Return data for no success:

Command[0]	\x00
Command[1]	\x03
Data[0]	\x00

- Projector type:

DP100, XLM-Series.

## **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

11	\x41	(see Notes)
12	\x42	(see Notes)
13	\x43	(see Notes)
14	\x44	(see Notes)

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 !

■ Notes:

Key 11, 12, 13 and 14 can only be used in a DP100.

## 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	\x0d
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 (OPTIONAL):

Data[0]	
	Byte to mask bits of the return data. \xff is equal to sending no optional data byte

- Return Data:

The return data consists of one data byte containing the projector status. Only bit0 (least significant bit) to bit3/bit6 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
bit5	no alternative content	alternative content
bit6*	lamp is off	lamp is on

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

\*: bit 3 is only significant on projectors that can show only one image at a time (no picture in picture or windowing capabilities).

\*: bit 6 is not available on all projectors (check your owners manual).

## 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]	\x0b
Checksum	\x73
Stop	\xff

## projector status, write off

- Description:

Set the projector off.

- Command:

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

- Data:

No data bytes.

- Note:

In case of the XLM-Series or a DP100, this command only turns of the power, not the lamp.

- 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.

- Note:

In case of the XLM-Series or a DP100, this command only turns on the power, not the lamp.

- 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	\x0a
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..).

■ Notes:

- In case of a DP100 or the XLM-Series, this command can be used as a prefix command for another command (the main command).
- In case this command is used as a prefix command, it will be executed before the main command is handled. All messages sent to the user (acknowledge, no acknowledge, answer, ...) are related to the main command.
- In case this command is used as a prefix command, it will be undone after execution of the main command.

■ 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:

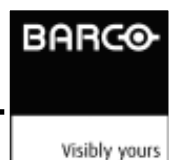
Increment volume of a projector with address \x01 by one.

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



### 3. 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



**alpha blending, read**

- Description:  
Read the alpha blending.

- Command:

Command[0]	\x21
Command[1]	\x8d
Command[2]	\x44
Command[3]	\x45

- Data:  
No data bytes.
- Return data:  
Data[0,1] = alpha blending value (0..255).  
This value is a multi-byte value (see syntax).
- Projector type:  
DP100, XLM-Series.



## alpha blending, write

- Description:  
Write the alpha blending.

- Command:

Command[0]	\x20
Command[1]	\x8d
Command[2]	\x44

- Data:  
Data[0] = 0  
Data[1] = alpha blending value
- Projector type:  
DP100, XLM-Series.

## 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]	\x0a
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

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



## **baud rate pc, read**

- Description:

Read the pc baud rate.

- Command:

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

- Data:

No data bytes.

- Return Data:

The return data-transfer being the pc baud rate is a C-language string (see syntax).

Data[]	C-language string
--------	-------------------

- Projector type:

Not all projectors support this command.

- Example:

Read the pc baud rate of a projector with address \x01. Suppose the baud rate is 2400 baud..

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x75
Checksum	\x76
Stop	\xff

## baud rate pc, 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]	\x75
Data[0]	\x32 (= '2')
Data[1]	\x34 (= '4')
Data[2]	\x30 (= '0')
Data[3]	\x30 (= '0')
Data[4]	\x00
Checksum	\x3c
Stop	\xff

## **baud rate pc, write**

■ Description:

Change the pc baud rate.

■ Command:

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

■ Data:

Data[]	C-language string
--------	-------------------

■ Notes:

- The acknowledge is sent at the same baud rate as the question. The baud rate will be changed after transmission of the acknowledge sequence.

- If the data contains a non-valid C-language string or an invalid baud rate, the baud rate will be set to 9600.

■ Example:

Change the pc baud rate 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

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

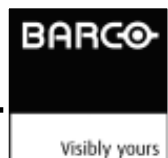
- Example:  
Set the blanking bottom to 0 on a projector with address \x01.

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



## **blinking 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

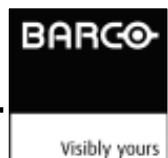
- Example:

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



## **blinking right, decrement**

- Description:  
Decrement blinking right.

- Command:

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

- Data:  
No data bytes.

- Example:

Decrement blinking 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

## **blinking right, read**

- Description:  
Read the actual value of blinking right.

- Command:

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

- Data:  
No data bytes.

- Return Data:  
Data[0..1] = value of blinking right.

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

- Example:  
Read the actual value of blinking right of a projector with address \x01. Suppose the blinking 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



## **blinking 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

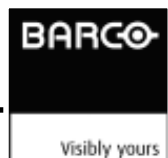
- Example:

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

## **button, read macro**

- Description:  
Read the name of the macro attached to a button.

- Command:

Command[0]	\xe8
Command[1]	\x05

- Data:

Data[0] = Macro-Button number

	Data[0]
Macro-Button 1	\x01
Macro-Button 2	\x02
...	...

Data[1] = OPTIONAL

In this case, Data[0] indicates "From" Macro-Button number and Data[1] indicates "To" Macro-Button number.

- Return Data:

In case the optional Data[1] wasn't sent:

Data[0] = Macro-Button number.

Data[1..] = Macro name(s) as C-language string(s) (see syntax).

In case the optional Data[1] was sent:

Data[0] = From Macro-Button number.

Data[1] = To Macro-Button number.

Data[2..] = Macro name(s) as C-language string(s) (see syntax).

- Projector type:

DP100.

- Example:

Read the macro name attached to macro-button 2 of a projector with address \x01. Suppose the macro name is "ABC".



## **button, read macro**

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xe8
Command[1]	\x05
Data[0]	\x02
Checksum	\xf0
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]	\xe8
Command[1]	\x05
Data[0]	\x02
Data[1]	\x41 (= 'A')
Data[2]	\x42 (= 'B')
Data[3]	\x43 (= 'C')
Data[4]	\x00
Checksum	\xb6
Stop	\xff

## **button, write macro**

- Description:

Write the name of the macro to be attached to a button.

- Command:

Command[0]	\xe8
Command[1]	\x85

- Data:

Data[0] = Macro-Button number

Data[1..] = Macro name as a C-language string (see syntax).

	Data[0]
Macro-Button 1	\x01
Macro-Button 2	\x02
...	...

- Projector type:

DP100.

- Example:

Write the macro name to be attached to macro-button 2 of a projector with address \x01. Suppose the macro name is "ABC".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xe8
Command[1]	\x85
Data[0]	\x02
Data[1]	\x41 (= 'A')
Data[2]	\x42 (= 'B')
Data[3]	\x43 (= 'C')
Data[4]	\x00
Checksum	\x36
Stop	\xff

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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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

- Projector type:  
Not supported on DP100 and XLM-Series.

- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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.
- Projector type:  
Not supported on DP100 and XLM-Series.
- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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.

- Projector type:

Not supported on DP100 and XLM-Series.

- 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:

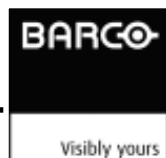
Read the actual color value of a projector with address \x01. Suppose the color equals \x20.

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.

- Projector type:

For XLM-Series and DP100, see command "color temperature, decrement gain".

- 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.

- Projector type:

For XLM-Series and DP100, see command "color temperature, increment gain".

- 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

- Return data:

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

Data[0]	\x00..\xfa
---------	------------

Example: Data[0]=\x64 equals 1.00

- Projector type:

For XLM-Series and DP100, see command "color temperature, read".

## 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

- Projector type:

For XLM-Series and DP100, see command "color temperature, write".

- Example:

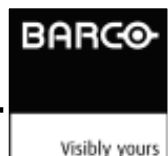
Set the color balance red/green to 1.00 on a projector with address \x01.

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 key, read (1)

- Description:  
Read the color key.

- Command:

Command[0]	\x21
Command[1]	\x8d
Command[2]	\x52
Command[3]	\x53

- Data:  
No data bytes.

- Return data:

Data[0,1]	0 = Off 1 = On
-----------	-------------------

This value is a multi-byte value (see syntax).

- Projector type:  
DP100, XLM-Series.

## color key, read (2)

- Description:  
Read the color key.

- Command:

Command[0]	\x21
Command[1]	\x8d
Command[2]	\x46
Command[3]	\x51

- Data:  
No data bytes.

- Return data:

Data[0,1]	Range
Data[2,3]	Red
Data[4,5]	Green
Data[6,7]	Blue
Data[8,9]	Palette 0 = RGB 1 = Red 2 = Green 3 = Blue
Data[10,11]	Algorithm 0 = None 1 = Higher 2 = Lower 3 = Equal 4 = Inside range 5 = Outside range

All values are multi-byte values (see syntax).

- Projector type:  
DP100, XLM-Series.

## color key, write (1)

- Description:  
Write the color key.

- Command:

Command[0]	\x20
Command[1]	\x8d
Command[2]	\x52

- Data:

Data[0,1]	0 = Off 1 = On
-----------	-------------------

This value is a multi-byte value (see syntax).

- Projector type:  
DP100, XLM-Series.

- Note:

This command enables or disables the color key and sets the color key algorithm to "None"!

## color key, write (2)

- Description:  
Write the color key.

- Command:

Command[0]	\x20
Command[1]	\x8d
Command[2]	\x46

- Data:

Data[0,1]	Range
Data[2,3]	Red
Data[4,5]	Green
Data[6,7]	Blue
Data[8,9]	Palette 0 = RGB 1 = Red 2 = Green 3 = Blue
Data[10,11]	Algorithm 0 = None 1 = Higher 2 = Lower 3 = Equal 4 = Inside range 5 = Outside range

All values are multi-byte values (see syntax).

- Projector type:  
DP100, XLM-Series.

## color temperature, decrement gain

- Description:  
Decrement the color temperature red, green or blue gain.
- Command (color temperature red gain):

Command[0]	\x23
Command[1]	\x93

Command (color temperature green gain):

Command[0]	\x23
Command[1]	\x94

Command (color temperature blue gain):

Command[0]	\x23
Command[1]	\x95

- Data:  
No data bytes.
- Example:  
Decrement the color temperature red gain of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x23
Command[1]	\x93
Checksum	\xb7
Stop	\xff

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

## color temperature, increment gain

- Description:  
Increment the color temperature red, green or blue gain.
- Command (color temperature red gain):

Command[0]	\x22
Command[1]	\x93

Command (color temperature green gain):

Command[0]	\x22
Command[1]	\x94

Command (color temperature blue gain):

Command[0]	\x22
Command[1]	\x95

- Data:  
No data bytes.
- Example:  
Increment the color temperature red gain of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x22
Command[1]	\x93
Checksum	\xb6
Stop	\xff

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:

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

or Data = C-language string containing the name of a color temperature file.

Data	C-language string
------	-------------------

- Notes:
  - Return data = Data[0] for all projectors without a directory structure.
  - Return data = C-language string for all projectors with a directory structure.



## 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, read gain

- Description:  
Read the color temperature red, green or blue gain.

- Command (color temperature red gain):

Command[0]	\x21
Command[1]	\x93

Command (color temperature green gain):

Command[0]	\x21
Command[1]	\x94

Command (color temperature blue gain):

Command[0]	\x21
Command[1]	\x95

- Data:  
No data bytes.
- Return Data:  
Data[0] = gain x 100 (for example Data[0] for 1.00 is 100).
- Example:

Read the color temperature red gain of a projector with address \x01. Suppose the red gain is 1.25.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x93
Checksum	\xb5
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]	\x93
Data[0]	\x7d
Checksum	\x32
Stop	\xff

## color temperature, write

- Description:  
Write the color temperature.
- Command:

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

- Data (see notes):  
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

or Data = C-language string containing the name of a color temperature file.

Data	C-language string
------	-------------------

- Notes:
  - Data = Data[0] for all projectors without a directory structure.
  - Data = C-language string for all projectors with a directory structure.

## 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

## color temperature, write gain

- Description:  
Write the color temperature red, green or blue gain.
- Command (color temperature red gain):

Command[0]	\x20
Command[1]	\x93

Command (color temperature green gain):

Command[0]	\x20
Command[1]	\x94

Command (color temperature blue gain):

Command[0]	\x20
Command[1]	\x95

- Data:  
Data[0] = gain x 100 (for example Data[0] for 1.00 is 100).
- Example:  
Set the color temperature red gain to 1.25 on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x93
Data[0]	\x7d
Checksum	\x31
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



## communication port interface standard, read

- Description:  
Read the interface standard of a communication port.

- Command:

Command[0]	\x77
Command[1]	\xc0
Command[2]	port number
Command[3]	\x03

- Data:  
No data bytes.

- Return Data:

Data[0] = RS232 or RS422

Data[1] = RS422 termination

	Data[0]
RS232	\x00
RS422	\x01

RS422 termination	Data[1]
Off	\x00
On	\x01

- Note:  
See your Owner's Manual for a list of the port numbers.
- Projector type:  
DP100, XLM-Series.

## communication port interface standard, read

■ Example:

Read the interface standard of communication port \x01 of a projector with address \x01. Suppose the interface standard is RS232.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x77
Command[1]	\xc0
Command[2]	\x01
Command[3]	\x03
Checksum	\x3c
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]	\x77
Command[1]	\xc0
Command[2]	\x01
Command[3]	\x03
Data[0]	\x00
Data[1]	\x00
Checksum	\x3c
Stop	\xff

## **communication port interface standard, write**

- Description:

Write (change) the interface standard of a communication port.

- Command:

Command[0]	\x77
Command[1]	\xc0
Command[2]	port number
Command[3]	\x83

- Data:

Data[0] = RS232 or RS422

Data[1] = RS422 termination

	Data[0]
RS232	\x00
RS422	\x01

RS422 termination	Data[1]
Off	\x00
On	\x01

- Note:

See your Owner's Manual for a list of the port numbers.

- Projector type:

DP100, XLM-Series.

## communication port interface standard, write

■ Example:

Set the interface standard of communication port \x01 of a projector with address \x01 to RS232.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x77
Command[1]	\xc0
Command[2]	\x01
Command[3]	\x83
Data[0]	\x00
Data[1]	\x00
Checksum	\xbc
Stop	\xff

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

## diagnosis 3, read

- Description:  
Read diagnosis information.
- Command:

Command[0]	\x81
Command[1]	\x03
Command[2]	From data index
Command[3]	To data index

or Command:

Command[0]	\x81
Command[1]	\x03
Command[2..3]	From data index
Command[4..5]	To data index

- Data:  
No data bytes.
- Return Data:  
The return data depends on the "From data index" and "To data index".

Index		
0	Temp. TEC Red	°C
1	Temp. TEC Green	°C
2	Temp. TEC Blue	°C
3	Temp. Ambient	°C
4	Temp. Lamp House	°C
5	Elcabox	°C
6	Temp. Heatsink SMPS 1 Sec.	°C
7	Temp. Heatsink SMPS 2 Sec.	°C
8	Rack	°C
9	TEC Status	

### **diagnosis 3, read**

10..11	Voltage ++5V	mV
12..13	Voltage ++12V	mV
14..15	Voltage +3.3V	mV
16..17	Voltage +5V	mV
18..19	Voltage +12V	mV
20..21	Voltage +24V Elek.	mV
22..23	Voltage +12V D320	mV
24..25	Voltage +TEC	mV
26..67	Voltage +Fan0	mV
28..29	Voltage +Fan1	mV
30..31	Voltage +Fan2	mV
32..33	Voltage +Fan3	mV
34..35	Fan 1 Elcabox	RPM
36..37	Fan 2 Elcabox	RPM
38..39	Fan 3 Elcabox	RPM
40..41	Fan 4 Elcabox	RPM
42..43	Fan Cold Mirror Top	RPM
44..45	Fan Cold Mirror Bottom	RPM
46..47	Fan Light Tube	RPM
48..49	Fan Start Pulse Generator	RPM
50..51	Fan Lamp Top	RPM
52..53	Fan Lamp Anode	RPM
54..55	Fan Lamp Cathode	RPM
56..57	Fan Sealing	RPM
58	Temp. Heatsink PFC	°C
59	Temp. Heatsink SMPS 1 Prim.	°C
60	Temp. Heatsink SMPS 2 Prim.	°C
61	Switch Air Flow	on/off
62	Switch Lamp House	on/off
63	Switch Tilt	on/off
64	Switch Engine Mount	on/off
65	Water flow sensor	on/off
66	Water level sensor	on/off
67	reserved	

## diagnosis 3, read

68..71	<b>Errors</b> bit0 = Errors 0 (Index 72..75) bit1 = Errors 1 (Index 76..79) bit2 = Errors 2 (Index 80..83) bit3 = Errors 3 (Index 84..87)	
72..75	<b>Errors 0</b> bit0 = Lower Limit Index 0 bit1 = Upper Limit Index 0 bit2 = Lower Limit Index 1 bit3 = Upper Limit Index 1 bit4 = Lower Limit Index 2 bit5 = Upper Limit Index 2 bit6 = Lower Limit Index 3 bit7 = Upper Limit Index 3 bit8 = Lower Limit Index 4 bit9 = Upper Limit Index 4 bit10 = Lower Limit Index 8 bit11 = Upper Limit Index 8 bit12 = Lower Limit Index 6 bit13 = Upper Limit Index 6 bit14 = Lower Limit Index 7 bit15 = Upper Limit Index 7 bit16 = Lower Limit Index 5 bit17 = Upper Limit Index 5	
76..79	<b>Errors 1</b> bit0 = Lower Limit Index 10..11 bit1 = Upper Limit Index 10..11 bit2 = Lower Limit Index 12..13 bit3 = Upper Limit Index 12..13 bit4 = Lower Limit Index 14..15 bit5 = Upper Limit Index 14..15 bit6 = Lower Limit Index 16..17 bit7 = Upper Limit Index 16..17 bit8 = Lower Limit Index 18..19 bit9 = Upper Limit Index 18..19 bit10 = Lower Limit Index 20..21 bit11 = Upper Limit Index 20..21 bit12 = Lower Limit Index 22..23 bit13 = Upper Limit Index 22..23 bit14 = Lower Limit Index 24..25 bit15 = Upper Limit Index 24..25 bit16 = Lower Limit Index 26..27 bit17 = Upper Limit Index 26..27 bit18 = Lower Limit Index 28..29 bit19 = Upper Limit Index 28..29 bit20 = Lower Limit Index 30..31 bit21 = Upper Limit Index 30..30 bit22 = Lower Limit Index 32..33 bit23 = Upper Limit Index 32..33	

**diagnosis 3, read**

80..83	<b>Errors 2</b> bit0 = Lower Limit Index 34..35 bit1 = Upper Limit Index 34..35 bit2 = Lower Limit Index 36..37 bit3 = Upper Limit Index 36..37 bit4 = Lower Limit Index 38..39 bit5 = Upper Limit Index 38..39 bit6 = Lower Limit Index 40..41 bit7 = Upper Limit Index 40..41 bit8 = Lower Limit Index 42..43 bit9 = Upper Limit Index 42..43 bit10 = Lower Limit Index 44..45 bit11 = Upper Limit Index 44..45 bit12 = Lower Limit Index 46..47 bit13 = Upper Limit Index 46..47 bit18 = Lower Limit Index 48..49 bit19 = Upper Limit Index 48..49 bit20 = Lower Limit Index 50..51 bit21 = Upper Limit Index 50..51 bit22 = Lower Limit Index 52..53 bit23 = Upper Limit Index 52..53 bit24 = Lower Limit Index 54..55 bit25 = Upper Limit Index 54..55 bit26 = Lower Limit Index 56..57 bit27 = Upper Limit Index 56..57	
84..87	<b>Errors 3</b> bit0 = Lower Limit Index 61 bit1 = Upper Limit Index 61 bit2 = Lower Limit Index 62 bit3 = Upper Limit Index 62 bit6 = Lower Limit Index 63 bit7 = Upper Limit Index 63 bit8 = Lower Limit Index 64 bit9 = Upper Limit Index 64 bit12 = Lower Limit Index 65 bit13 = Upper Limit Index 65 bit14 = Lower Limit Index 66 bit15 = Upper Limit Index 66 bit16 = Lower Limit Index 58 bit17 = Upper Limit Index 58 bit18 = Lower Limit Index 59 bit19 = Upper Limit Index 59 bit20 = Lower Limit Index 60 bit21 = Upper Limit Index 60	
88..95	EFIB status (see TI Product Specification); XLM-Series only!	
96..111	Red Modular Formatter status (see TI Product Specification); XLM-Series only!	
112..127	Green Modular Formatter status (see TI Product Specification); XLM-Series only!	
128..143	Blue Modular Formatter status (see TI Product Specification); XLM-Series only!	



### **diagnosis 3, read**

152..153	Temp. TEC Red Range	°C
154..155	Temp. TEC Green Range	°C
156..157	Temp. TEC Blue Range	°C
158..159	Temp. Ambient Range	°C
160..161	Temp. Lamp House Range	°C
162..163	Temp. Elcabox Range	°C
164..165	Temp. Heatsink SMPS 1 Sec. Range	°C
166..167	Temp. Heatsink SMPS 2 Sec. Range	°C
168..169	Temp. Rack Range	°C
170..173	Voltage ++5V Range	mV
174..177	Voltage ++12V Range	mV
178..181	Voltage +3.3V Range	mV
182..185	Voltage +5V Range	mV
186..189	Voltage +12V Range	mV
190..193	Voltage +24V Elek. Range	mV
194..197	Voltage +12V D320 Range	mV
198..201	Voltage +TEC Range	mV
202..205	Voltage +Fan0 Range	mV
206..209	Voltage +Fan1 Range	mV
210..213	Voltage +Fan2 Range	mV
214..217	Voltage +Fan3 Range	mV
218..221	Fan 1 Elcabox Range	RPM
222..225	Fan 2 Elcabox Range	RPM
226..229	Fan 3 Elcabox Range	RPM
230..233	Fan 4 Elcabox Range	RPM
234..237	Fan Cold Mirror Top Range	RPM
238..241	Fan Cold Mirror Bottom Range	RPM
242..245	Fan Light Tube Range	RPM
246..249	Fan Start Pulse Generator Range	RPM
250..253	Fan Lamp Top Range	RPM
254..257	Fan Lamp Anode Range	RPM
258..261	Fan Lamp Cathode Range	RPM
262..265	Fan Sealing Range	RPM
266..269	Temp. Heatsink PFC Range	°C
270..273	Temp. Heatsink SMPS 1 Prim. Range	°C
274..277	Temp. Heatsink SMPS 2 Prim. Range	°C
278..281	Switch Air Flow Range	on/off
282..285	Switch Lamp House Range	on/off
286..289	Switch Tilt Range	on/off
290..293	Switch Engine Mount Range	on/off
294..297	Water flow sensor Range	on/off
298..301	Water level sensor Range	on/off

## diagnosis 3, read

- Projector type:

DP100, XLM-Series.

- Example:

Read the TEC values for Red, Green and Blue of a projector with address \x01.  
Suppose the values are \x20, \x25 and \x23.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x81
Command[1]	\x03
Command[2]	\x00
Command[3]	\x02
Checksum	\x87
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]	\x81
Command[1]	\x03
Command[2]	\x00
Command[3]	\x02
Data[0]	\x20
Data[1]	\x25
Data[2]	\x23
Checksum	\xef
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

## **directory, write to profile**

- Description:

Write the contents of a directory to a profile.

- Command:

Command[0]	\xbd
Command[1]	\xc0

- Data:

Directory path	C-language string
Directory filter	C-language string
Profile path	C-language string
Profile section name	C-language string
File permissions (OPTIONAL)	C-language string (see Notes)
Extra (OPTIONAL)	C-language string (see Notes)

- Notes:

File permissions:

- Characters allowed = 'r' (read), 'w' (write) and 'x' (execute).
- The file permissions indicate which permissions are checked.
- If no file permissions are given, all files will be written.
- Example 1: if the file permissions are "rw", then all files that have read and/or write permission are written.

Extra:

- Extra options dependent on the type of directory.

- Projector type:

All projectors with directory structure.

- Note:

A directory filter can be "\*.txt".

- Example:

Not yet available.

## **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

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

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

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

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

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

- Projector type:  
Please verify the Owner's Manual of the projector if the field polarity is implemented.

- 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

- Projector type:  
Please verify the Owner's Manual of the projector if the field polarity is implemented.

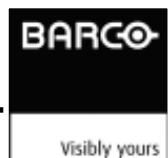
- Example:

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

- Projector type:  
Please verify the Owner's Manual of the projector if the field select is implemented.

- 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

- Projector type:

Please verify the Owner's Manual of the projector if the field select is implemented.

- 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).

- Projector type:

Not supported on DP100 and XLM-Series.

- Example:

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

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

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).
- Projector type:  
Not supported on DP100 and XLM-Series.
- 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

- Description:  
Get a list of files.

- Command:

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

- Data:  
One or more filenames (wildcards allowed).

- Projector type:  
Not supported on DP100 and XLM-Series.

- 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

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]	\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

- Description:

Load a file.

- Command:

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

- Data:

Data = Filename as a C-language string (see syntax).

If no filename is specified, the projector automatically chooses a file.

- Projector type:

DP100, XLM-Series.

- Example:

Load the file "video625" on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xbd
Command[1]	\x82
Data[0]	\x76 (= 'v')
Data[1]	\x69 (= 'i')
Data[2]	\x64 (= 'd')
Data[3]	\x65 (= 'e')
Data[4]	\x6f (= 'o')
Data[5]	\x36 (= '6')
Data[6]	\x32 (= '2')
Data[7]	\x35 (= '5')
Data[8]	\x00
Checksum	\xf4
Stop	\xff

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).

- Projector type:

Not supported on DP100 and XLM-Series.

- Example:

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

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

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

- Projector type:

Not supported on DP100 and XLM-Series.

- 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, read permission**

- Description:  
Read the permissions of a file.

- Command:

Command[0]	\xbd
Command[1]	\x48

- Data:

Path	C-language string
------	-------------------

Path: File name starting with an environment name.

- Return Data:

Path	C-language string
File permissions	C-language string

File permissions:

Data[0]	read	'r'	or '-'
Data[1]	write	'w'	or '-'
Data[2]	execute	'x'	or '-'
Data[3]		\x00	

- Projector type:  
All projectors with directory structure.
- Example:  
Not yet available.



## **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).

- Projector type:

Not supported on DP100 and XLM-Series.

- 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

- Projector type:

Not supported on DP100 and XLM-Series.

- Example (imaginary):

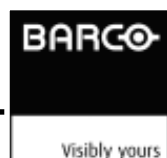
Write the contents of the file "ntsc .c01" on a projector with address \x01.

## 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	\x4a
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

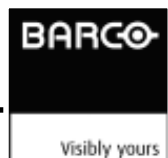
- Example:

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



## **image orientation, read**

- Note:  
See "installation, read".

## **image orientation, write**

- Note:  
See "installation, write".

## information display, read

- Description:  
Read the information display codes.

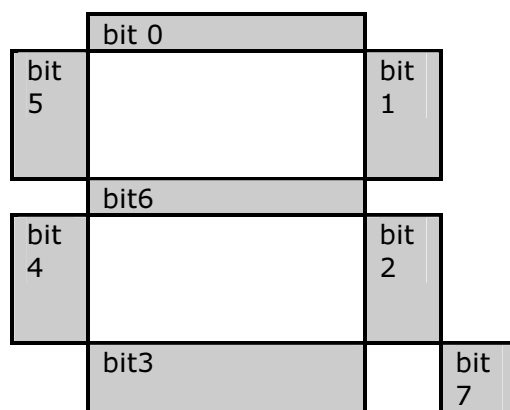
- Command:

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

- Data:  
No data bytes.

- Return Data:

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



bit7 = most significant bit

- Projector type:  
All projectors with an information display.



## 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
bit3	receiver side disabled	receiver side enabled

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

- Notes:
  - In case of a DP100 or the XLM-Series, bit2 is undetermined.
  - Not all projectors have all (front, rear and side) receivers. Check your Owner's Manual.

## 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
bit2	-	-
bit3	disable receiver side	enable receiver side

\*: when no hardwired remote is connected, the receiver front, rear and side cannot be disabled; so bit0, bit1 and bit3 will take effect after a hardwired remote has been connected.

- Note:

Not all projectors have all (front, rear and side) receivers. Check your Owner's Manual .

- 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

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, read**

- Description:  
Read the active internal pattern.

- Command:

Command[0]	\x41
Command[1]	\xc1

- Data:  
No data bytes.
- Return Data:  
The return data-transfer being the file name of the internal pattern is a C-language string (see syntax).
- Projector type:  
DP100, XLM-Series.

## 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)

### Other pattern (file name) - see notes

Data[0]	\xc0
Data[1..]	C-language string containing the file name

#### ■ Notes:

- 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" and "Other pattern")

	Data[next] <sup>OPTIONAL</sup>
not inverted	\x00
inverted	\x01

- The file names that can be used for "Other pattern" can be found in the menu structure or in the Owner's Manual.

- The file names that can be used for "Other pattern" are case sensitive.

## 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

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	\x0d
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	\x0e
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:

Maximum lamp run time (seconds)

$$= \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3]$$

- 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:

Lamp message run time (seconds)  
= Data[0]\*256<sup>3</sup> + Data[1]\*256<sup>2</sup> + Data[2]\*256 + Data[3]

- 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

lamp message run time =

$$\backslash x00 * 256^3 + \backslash x35 * 256^2 + \backslash x48 * 256 + \backslash xa0$$

## **lamp, read nominal current**

- Description:

Read the nominal current of the lamp.

- Command:

Command[0]	\x76
Command[1]	\x9d

- Data:

No data bytes.

- Return Data:

The return data-transfer being the lamp nominal current is a Multi-byte value (see syntax).

- Projector type:

Not all projectors support this command.

- Example:

Read the lamp nominal current of a projector with address \x01. Suppose the nominal current is 100 A.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x9d
Checksum	\x14
Stop	\xff

## lamp, read nominal current

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]	\x9d
Data[0]	\x00
Data[1]	\x00
Data[2]	\x00
Data[3]	\x64
Checksum	\x78
Stop	\xff



## lamp, read power

- Description:

Read the actual lamp power.

- Command:

Command[0]	\x76
Command[1]	\x8f

- Data:

No data bytes.

- Return Data:

The return data-transfer being the lamp power is a Multi-byte value (see syntax).

- Projector type:

Not all projectors support this command.

- Example:

Read the lamp power of a projector with address \x01. Suppose the power is 1000 W.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x8f
Checksum	\x06
Stop	\xff

## lamp, read power

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]	\x8f
Data[0]	\x00
Data[1]	\x36
Data[2]	\xee
Data[3]	\x80
	\x00
Checksum	\xaa
Stop	\xff

## 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:

Lamp run time (hours)

$$= \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3]$$

- 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 =

$$\text{\x00} * 256^3 + \text{\x00} * 256^2 + \text{\x00} * 256 + \text{\x64}$$

## 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:

Number of strikes

$$= \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3]$$

- 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:

Lamp warning run time (seconds)

$$= \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3]$$

- 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

lamp warning run time =

$$\backslashx00 * 256^3 + \backslashx36 * 256^2 + \backslashxee * 256 + \backslashx80$$

## **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).  
Optionally, the lamp serial number can be followed by the lamp article number which is also a pascal-language string (see syntax).

- 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.
- The lamp article number (optional data) is only allowed when the projector supports multiple lamp types.

## 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 on/off

- Description:  
Write lamp on/off.

- Command:

Command[0]	\x76
Command[1]	\x1a

- Data:

	Data[0]
Off	\x00
On	\x01

- Projector type:

Only for projectors where the lamp can be switched on/off independent from the power.

- Example:

Set the lamp on of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x76
Command[1]	\x1a
Data[0]	\x01
Checksum	\x92
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

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)".

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)".

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

## layout, load

- Note:  
See "layout, write".

## layout, read

- Description:  
Read the active layout name/path.

- Command:

Command[0]	\x21
Command[1]	\x90

- Data (OPTIONAL):

Data[0]	
-	The return data will contain the layout name.
\x01	The return data will contain the layout path.

- Projector type:  
See your Owner's Manual to verify if your projector works with layout files.
- Return Data:  
The return data-transfer being the layout name/path is a C-language string (see syntax).
- Example:  
Read the name of the active layout of a projector with address \x01. Suppose the layout is "1.txt".



Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x90
Checksum	\xb2
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]	\x90
Data[0]	\x31
Data[1]	\x2e
Data[2]	\x74
Data[3]	\x78
Data[4]	\x74
Data[5]	\x00
Checksum	\x71
Stop	\xff

## layout, save

- Description:  
Save the active layout.

- Command:

Command[0]	\x28
Command[1]	\x90

- Data (OPTIONAL):

Data[0..]	
-	Save the active layout with its current name/path.
C-language string	Save the active layout with a new name/path.

- Projector type:  
See your Owner's Manual to verify if your projector works with layout files.

- Example:

Save the active layout as "1.txt" on a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x28
Command[1]	\x90
Data[0]	\x31
Data[1]	\x2e
Data[2]	\x74
Data[3]	\x78
Data[4]	\x74
Data[5]	\x00
Checksum	\x78
Stop	\xff

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

## **layout, write**

- Description:  
Activate a new layout.

- Command:

Command[0]	\x20
Command[1]	\x90

- Data:  
The data-transfer being the layout name/path is a C-language string (see syntax).
- Projector type:  
See your Owner's Manual to verify if your projector works with layout files.
- Example:  
Activate the layout "1.txt" on a projector with address \x01.

## layout, write

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x20
Command[1]	\x90
Data[0]	\x31
Data[1]	\x2e
Data[2]	\x74
Data[3]	\x78
Data[4]	\x74
Data[5]	\x00
Checksum	\x70
Stop	\xff

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

## lens, anamorphic

- Description:  
Adjust the anamorphic lens.
- Command:

Command[0]	\xf4
Command[1]	\x86

- Data:  
Data[0] = function

Function	Data[0]	
Off	\x00	Data[1] not allowed !
On	\x01	Data[1] not allowed !
Shift out	\x82	
Shift in	\x83	
Pin out	\x84	
Pin in	\x85	

Data[1] = speed (OPTIONAL)

Speed ( <u>OPTIONAL</u> )	Data[1]
Fine ( <u>DEFAULT</u> )	\x00
Coarse	\x01

- Projector type:  
All projectors with motorized lens anamorphic.
- Example:  
Activate the anamorphic lens of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\xf4
Command[1]	\x86
Data[0]	\x01
Checksum	\x7c
Stop	\xff

## lens, anamorphic

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

- 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

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

- 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

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

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

- 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

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

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

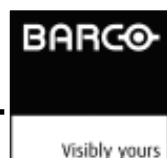
- Example:  
Read the active number of lines on a projector with address \x01. Suppose the active number of lines is 480 (\x01e0).

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

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

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).

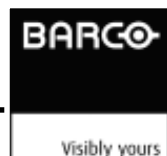
Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x58
Checksum	\x7a
Stop	\xff



**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

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.

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>	\x0d

- 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

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

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

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>	\x0d

- 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]	\x0d
Checksum	\x02
Stop	\xff

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

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

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

## **macro, execute (1)**

- Description:  
Execute a TI macro.

- Command:

Command[0]	\xe8
Command[1]	\x81

- Data:

Data[]	C-language string
--------	-------------------

- Projector type:  
DP100.



## **macro, read (1)**

- Description:  
Read the name of the last TI macro that has been executed.

- Command:

Command[0]	\xe8
Command[1]	\x01

- Return data:

Data[]	C-language string
--------	-------------------

- Projector type:  
DP100.

## 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.ccc.ddd)  
Data[5..8] = Subnet Mask (aaa.bbb.ccc.ddd)  
Data[9..12] = Default Gateway (aaa.bbb.ccc.ddd)  
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]

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

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

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, BD8000, DP100 and XLM-Series.

## 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	\x0b
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

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	-



## peripheral source, write

- 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.
- Projector type:

All projectors except DP100 and XLM-Series.
- 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

- 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

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

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

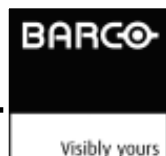
- Example:  
Read the active number of pixels on a projector with address \x01. Suppose the active number of pixels is 640 (\x0280).

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

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

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

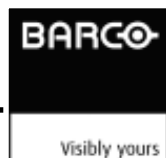
- Example:  
Read the total number of pixels on a projector with address \x01. Suppose the total number of pixels is 800 (\x0320).

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

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

## **profile, read count**

- Description:  
Read the number of entries in a profile section.

- Command:

Command[0]	\xbd
Command[1]	\x42

- Data:

Profile path	C-language string
Profile section name	C-language string

- Return Data:

Data[]	1, 2, 3 or 4 bytes
--------	--------------------

- Projector type:  
All projectors with directory structure.
- Example:  
Not yet available.

## **profile, read entry**

- Description:  
Read an entry of a profile.

- Command:

Command[0]	\xbd
Command[1]	\x41

- Data:

Profile path	C-language string
Profile section name	C-language string
Entry	1, 2, 3 or 4 bytes

- Projector type:  
All projectors with directory structure.
- Example:  
Not yet available.

## 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]	'I' = '\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+5]	x2(MSB)
Data[n+6]	x2(LSB)
Data[n+7]	y2(MSB)
Data[n+8]	y2(LSB)

## programmable blanking, write

- Projector type:

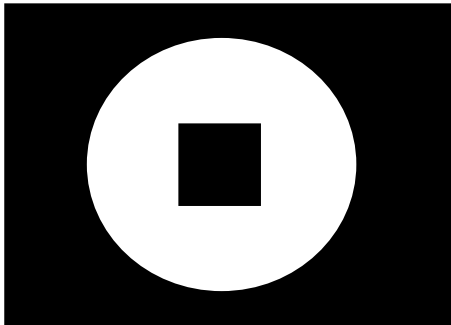
All projectors with programmable blanking.

- 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:

Projector run time (seconds)

$$= \text{Data}[0]*256^3 + \text{Data}[1]*256^2 + \text{Data}[2]*256 + \text{Data}[3]$$

- 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

projector run time =

$$\text{\x00} * 256^3 + \text{\xa4} * 256^2 + \text{\xcb} * 256 + \text{\x80}$$

## 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 '0000001'.

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, write serial number

- Description:

Write the serial number of the projector. The serial number can only be written once !

- Command:

Command[0]	\x61
------------	------

- Data:

Serial number as a pascal-language string (see syntax).

- Projector type:

Not all projectors support this command.

- Example:

Write the serial number of a projector with address \x01. Suppose the projector serial number is '0000001'.

Transmit	
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

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

## **projector, read type (1)**

- 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 (1)**

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x6b
Data[0]	\x0e
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, read type (2)**

- Description:  
Determine the type of projector you are communicating with.

- Command:

Command[0]	\x87
Command[1]	\x1b

- Data:  
No data bytes.

- Return Data:  
Data[0] = projector type.

Type	Data[0]
DP100	\x03
XLM-Series	\x04

- Projector type:  
DP100, XLM-Series.

- Example:  
Read the projector type of a projector with address \x01. Suppose the projector is a DP100.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x87
Command[1]	\x1b
Checksum	\xa3
Stop	\xff

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

## **projector, read type (2)**

Receive (answer)	
Start	\xfe
Projector address	\x01
Command[0]	\x87
Command[1]	\x1b
Data[0]	\x03
Checksum	\xa6
Stop	\xff

## projector, read address

- Description:  
Read the projector address.

- Command:

Command[0]	\x6d
------------	------

- Data:  
No data bytes.

- Return Data:  
Data[0] = projector address.

Data[0]	\x00..\xff
---------	------------

- Projector type:  
Not all projectors support this command.
- Example:  
Read the projector address of a projector with address \x01.

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x6d
Checksum	\x6e
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]	\x6d
Data[0]	\x01
Checksum	\x6f
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

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:

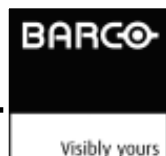
Read the actual value of the horizontal shift of a projector with address \x01. Suppose the horizontal shift equals 0.

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

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.

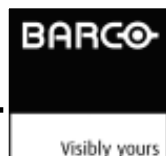
Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x21
Command[1]	\x48
Checksum	\x6a
Stop	\xff



**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

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

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

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:

Although some projectors don't make the difference between "Fast" and "Slow" speed, 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

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:

Although some projectors don't make the difference between "Fast" and "Slow" speed, 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

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.
- 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

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

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

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

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

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

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 language 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

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

- Description:  
Read the slot number, slot mode and slot type of the active source or slot.
- Command:

Command[0]	\x34
Command[1]	From index
Command[2]	To index

Index	
0	Source or slot number
1	Source or slot mode
2	Source or slot type

- Data:  
No data bytes.
- Return Data:  
Depends on the "From index" and "To index".

- Source or slot type:

Data	
\x00	D320 CVBS/S-VID
\x01	D320 SDI
\x02	D320 YUV/RGSB
\x03	D320 DVI
\x04	D320 RGB
\x05	D320 RGB AN UXGA
\x06	D320 HDS DI
\xff	No input

- Source or slot mode (depends on the source or slot type):

### D320 CVBS/S-VID Input

Data	Mode
\x00	Video
\x01	S-Video

### D320 YUV/RGSB Input

Data	Mode
\x00	YUV
\x01	RGSB

Other inputs have only one mode (\x00)

- Projector type:  
DP100, XLM-Series.

## 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	-

D320 CVBS/S-VID Input

Data[1]	Mode
\x00	Video
\x01	S-Video

D320 YUV/RGSB Input

Data[1]	Mode
\x00	YUV
\x01	RGSB

## 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

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, 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	

D320 CVBS/S-VID Input

Data[1]	Mode
\x00	Video
\x01	S-Video

D320 YUV/RGSB Input

Data[1]	Mode
\x00	YUV
\x01	RGSB

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)..

- 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	\x0e
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

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

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

- Description:  
Read version(s).
- Command:

Command[0]	\x60
Command[1]	From data index
Command[2]	To data index

Index		Version or Build
0	Main Program	Version
2	Lamp Module	Version
4	BARCO Lamp Power Supply with address 0x20	Version
6	BARCO Lamp Power Supply with address 0x22	Version
8	BARCO Lamp Power Supply with address 0x28	Version
10	SMPS	Version
12	Lens	Version
14	FPGA CPU Board	Version
16	Input 1 FPGA Scaler	Version
18	Input 2 FPGA Scaler	Version
20	Input 3 FPGA Scaler	Version
22	Input 4 FPGA Scaler	Version
24	Input 1 FPGA Overlayengine	Version
26	Input 2 FPGA Overlayengine	Version
28	Input 3 FPGA Overlayengine	Version
30	Input 4 FPGA Overlayengine	Version
32	Input 1 FPGA Featuremodule	Version
34	Input 2 FPGA Featuremodule	Version
36	Input 3 FPGA Featuremodule	Version
38	Input 4 FPGA Featuremodule	Version
40	FPGA Syncgenerator	Version
42	FPGA Displayinterface	Version
44	Input 1 FPGA 1 Inputmodule	Version
46	Input 1 FPGA 2 Inputmodule	Version
48	Input 2 FPGA 2 Inputmodule	Version
50	Input 2 FPGA 2 Inputmodule	Version
52	Input 3 FPGA 2 Inputmodule	Version
54	Input 3 FPGA 2 Inputmodule	Version
56	Input 4 FPGA 2 Inputmodule	Version
58	Input 4 FPGA 2 Inputmodule	Version
60	Device Driver Irq10	Version
62	Device Driver Irq12	Version
64	Jtag Mux	Version
66	Lens anamorphic	Version
68	Font	Version



**version, read**

Index		Version or Build
70	EFIB TI Software Boot	Version
72	EFIB TI Software Boot	Build
74	EFIB TI Software Main	Version
76	EFIB TI Software Main	Build
78	EFIB TI FPGA Firmware	Version
80	EFIB TI FPGA Firmware	Build
82	EFIB OEM De-Gamma Tables	Version
84	EFIB OEM De-Gamma Tables	Build
86	EFIB TI Sequence Data	Version
88	EFIB TI Sequence Data	Build
90	MF Red TI Configuration	Version
92	MF Red TI Configuration	Build
94	MF Red OEM De-Gamma Tables	Version
96	MF Red OEM De-Gamma Tables	Build
98	MF Red TI Main Application	Version
100	MF Red TI Main Application	Build
102	MF Red TI Sequences	Version
104	MF Red TI Sequences	Build
106	MF Green TI Configuration	Version
108	MF Green TI Configuration	Build
110	MF Green OEM De-Gamma Tables	Version
112	MF Green OEM De-Gamma Tables	Build
114	MF Green TI Main Application	Version
116	MF Green TI Main Application	Build
118	MF Green TI Sequences	Version
120	MF Green TI Sequences	Build
122	MF Blue TI Configuration	Version
124	MF Blue TI Configuration	Build
126	MF Blue OEM De-Gamma Tables	Version
128	MF Blue OEM De-Gamma Tables	Build
130	MF Blue TI Main Application	Version
132	MF Blue TI Main Application	Build
134	MF Blue TI Sequences	Version
136	MF Blue TI Sequences	Build
138	DVI-Input 1 Eeprom	Version
140	DVI-Input 2 Eeprom	Version
142	DVI-Input 3 Eeprom	Version
144	DVI-Input 4 Eeprom	Version

- Data:  
No data bytes.

## version, read

- Note:
  - All versions take 2 bytes. The first byte is the major number, the second byte is the minor number.  
Combine these two bytes to create the complete version number: version = "major-number.minor-number".
  - All build numbers take 2 bytes and should be interpreted as a Multi-byte value (see syntax)
- Return Data:

The return data depends on the "From data index" and "To data index". If the version is "0.0" or the build is "0", an error occurred.
- Projector type:

DP100, XLM-Series.
- Example:

Read the SMPS version of a projector with address \x01. Suppose the version is "1.2".

Transmit	
Start	\xfe
Projector address	\x01
Command[0]	\x60
Command[1]	\x0a
Command[2]	\x0b
Checksum	\x76
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]	\x60
Command[1]	\x0a
Command[2]	\x0b
Data[0]	\x01
Data[1]	\x02
Checksum	\x79
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

- Projector type:  
Please verify the Owner's Manual of the projector if the vertical refresh is implemented.
- 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.

- Projector type:

Please verify the Owner's Manual of the projector if the vertical refresh is implemented.

- 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.

- Projector type:

Please verify the Owner's Manual of the projector if the vertical refresh is implemented.

- 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

- Projector type:  
Please verify the Owner's Manual of the projector if the vertical sync polarity is implemented.

- 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.

- Projector type:

Please verify the Owner's Manual of the projector if the vertical sync polarity is implemented.

- 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.

- Projector type:

Please verify the Owner's Manual of the projector if the vertical sync polarity is implemented.

- 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.

- Projector type:

All projectors with audio control.

- 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

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.

- Projector type:

All projectors with audio control.

- 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]  
baud rate pc, read: \x75  
baud rate pc, write: \x75[baud rate]  
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]  
button, read macro: \xe8\x05[button]  
button, write macro: \xe8\x85[button][macro]



## **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, decrement red gain: \x23\x93  
color temperature, decrement green gain: \x23\x94  
color temperature, decrement blue gain: \x23\x95  
color temperature, increment red gain: \x22\x93  
color temperature, increment green gain: \x22\x94  
color temperature, increment blue gain: \x22\x95  
color temperature, read: \x21\x45  
color temperature, read red gain: \x21\x93  
color temperature, read green gain: \x21\x94  
color temperature, read blue gain: \x21\x95  
color temperature, write: \x20\x45[value]  
color temperature, write red gain: \x20\x93[value]  
color temperature, write green gain: \x20\x94[value]  
color temperature, write blue gain: \x20\x95[value]  
color, decrement: \x06  
color, increment: \x05  
color, read: \x21\x03  
color, write: \x20\x03[value]  
communication port interface standard, read: \x77\xc0[port]\x03  
communication port interface standard, write: \x77\xc0[port]\x83[strd][term]  
contrast, decrement: \x02  
contrast, increment: \x01  
contrast, read: \x21\x01  
contrast, write: \x20\x01[value]

## appendix: command summary

diagnosis3, read: \x81\x03[from][to]  
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: \xbe[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

image orientation, read: see "installation, read"  
image orientation, write: see "installation, write"  
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

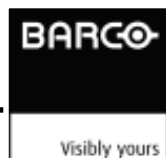
infrared control, EXIT: \x30\x08  
infrared control, FREEZ: \x30\x1b  
infrared control, F1: \x30\x6b  
infrared control, F2: \x30\x6c  
infrared control, F3: \x30\x6d  
infrared control, F4: \x30\x6e  
infrared control, F5: \x30\x6f  
infrared control, HELP: \x30\x1e  
infrared control, MUTE: \x30\x1f  
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 power: \x76\x8f  
lamp, read nominal current: \x76\x9d  
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 on/off: \x76\x1a[status]  
lamp, write status: \xc6  
language, read: \x71  
language, write: \x70[language]  
layout, load: see "layout, write"  
layout, read: \x21\x90  
layout, save: \x28\x90[optional path]  
layout, write: \x20\x90[path]  
lens, anamorphic: \xf4\x86[function][speed]  
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**

macro, execute (1): \xe8\x81[name]  
macro, read (1): \xe8\x01  
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, write serial number: \x61[value]  
projector, read type (1): \x6b  
projector, read type (2): \x87\x1b  
projector, read address: \x6d  
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, 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[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]

## **appendix: command summary**

version, read: \x60[from][to]  
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]

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