

Technical Reference

020-101697-01

Boxer 4K30 Serial API Commands



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Introduction

This document describes the serial protocol, consisting of ASCII text messages, used to control an Boxer 4K30 projector remotely.

Connection and use

Once you have connected your computer to either the RS232 IN port (depending on which standard is supported by your computer) or to the Ethernet port on a projector, you can remotely access projector controls and image setups, issue commands or queries, and receive replies. Use these bi-directional messages to:

- Control multiple projectors
 - Obtain a projector's status report
 - Diagnose performance problems
- 
 - Refer to the User Manual provided with the projector for all cable requirements and other connection details.
 - Some commands are operational only when projector is powered up.

Understanding message format

Messages can be one of three types:

- **Set**—A command to set a projector parameter at a specific level, such as changing to a certain channel.
- **Request**—A request for information, such as what channel is currently in use.
- **Reply**—The projector returns the data in response to a request or as confirmation of a command.

All remote control information passes in and out of the projector as a simple text message consisting of a three letter command code, an optional four letter subcode and any related data.

Generally, most commands include 0 or 1 data fields or parameters. Where applicable, a message may expand to include additional parameters of related details.

The smallest step size for any parameter is always 1. For some controls (such as Size) the value displayed on the screen has a decimal point (for example, 0.200 to 4.000). In this case, the values used for the serial communications is an integer value (for example, 200 to 4000), not the decimal value seen on the screen.

Regardless of message type or origin, all messages use the same basic format and code. Opening and closing round brackets (parentheses) surround each message, see [Basic message structure](#) on page 6.

Message formats

Source	Message Format	Function	Examples
From Controller	(Code Data)	SET (set contrast of main image to 500)	(CON500) or (CON 500)
	(Code+Subcode Data)	SET (set baud rate of port A aka RS232-IN port to item 5)	(BDR+PRTA 5)
From Controller	(Code ?)	REQUEST (what is current contrast?)	(CON?) or (CON ?)
	(Code+Subcode ?)	REQUEST (what is the speed of port A aka RS232-IN?)	(BDR+PRTA?)
From Projector	(Code Data)	REPLY (contrast is 500)	(CON!500)
	(Code+Subcode Data)	REPLY (BDR+PRTA?)	(BDR+PRTA!005 "57600")

Basic message structure

The following component fields comprise a standard ASCII message. Optional fields, such as extra characters for special modes, restrictions or added functionality, are shown in italics, with the exception of Notes.

- **Start and end of message:** Every message begins with the left bracket character and ends with the right bracket character.

If the start character is received before an end character of the previous message, the partial (previous) message is discarded.
- **Prefix characters (optional):** For acknowledgement that the projector has responded, and/or to maximize message integrity, insert one or two special characters before the three-character function code:
 - \$—Simple Acknowledgment, which causes a dollar sign (\$) character to be sent from the projector when it has finished processing the message, see [Maximizing message integrity on page 8](#).
 - #—Full Acknowledgment, which causes an echo of the message as a reply to be sent from the projector when it has finished processing the message, see [Maximizing message integrity on page 8](#).
 - &—Checksum, which allows a checksum to be put as the last parameter in the message for verification at the projector, see [Maximizing message integrity on page 8](#).
- **Projector numbers (optional):** To control a selected projector or controller within a group, include its assigned number or address just before the three-character ASCII function code.
- **Function code:** The projector function you want to work with, such as channel selection or gamma, is represented by a three-character ASCII code (A-Z, upper or lower case). This function code appears immediately after the leading bracket that starts the message. In

messages sent to the projector that do not have a subcode, a space between the function code and the first parameter (or special character) is optional.

- **+Subcode:** The projector function you want to work with may have one or more subcodes that allow you to select a specific source, image, channel or subfunction. The subcode is represented by a four-character ASCII code (A-Z, upper or lower case, and 0-9). This subcode appears immediately after the function code, with a plus sign (+) character to separate the code and subcode. If there is no subcode, the plus sign (+) is also omitted. In messages sent to the projector that do have a subcode, a space between the subcode and the first parameter (or special character) is optional.
- **Request/reply symbols:** If the controller is requesting information from the projector, a question mark (?) appears directly after the function code. If the projector is replying, an exclamation mark (!) appears directly after the function code. For set messages to the projector, neither of these characters appear—data directly follows the code and subcode.
- **Data:** The value for a given projector state, such as on or off, appears in ASCII-decimal format directly after the request/reply symbol. You can add an optional space after the symbol—such as before the data—in a set message, but data in replies follow the exclamation mark (!) symbol without a space. Other details to remember about data:
 - All values returned by the projector (reply messages) have a fixed length, regardless of the actual value. For a specific parameter the length is always be the same (for example, contrast is always returned as three characters, projector number is always returned as five characters). The minimum parameter size is three characters. Values less than the predefined size are padded with leading zeros as needed. Parameters which have negative signs are zero padded after the negative sign, and have one less digit to make space for the sign.
 - If entering a negative number, there must be a space between the code/subcode and the value for example (CRM3) and (CRM 3) can both be used when the number is positive. (CRM -2) is acceptable, but (CRM-2) is not.
 - Data in set messages to the projector do not require padding with zeros.
 - Within each message, multiple parameters of data must be separated by one space character.
 - Text parameters such as channel names are enclosed in double quotes following the data, as in Name.
- **Text parameters:** Most data is simply a numerical value, however some messages also require text. For example, a channel naming message typically includes a text-based name—enclose this text in double quotation marks, as in Tilt the Wagon. Use all characters as required except for the following special characters shown in the left column below—these require a two-character combination, see below.

Special characters for text

If you want this...	Enter this...	Description
\	\\	Backslash

If you want this...	Enter this...	Description
"	\"	Quote
(	\(	Left Bracket
)	\)	Right Bracket
0x0A	\n	New line —If the text can be displayed on more than one line, this sets the line break.
	\h##	Sends one arbitrary code defined by the two hexadecimal digits ##

Sample messages and their meaning

The following sections provide sample messages and outline their meaning.

For a single projector

Message Format	Function	Example
(Code Data)	SET (set contrast of main image to 500)	(CON500)
(Code+Subcode Data)	SET (set contrast of PIP image to 500)	(BDR+PRTA 500)
(Code?)	REQUEST (what is current contrast?)	(CON?)
(Code+Subcode?)	REQUEST (what is contrast of PIP image?)	(BDR+PRTA?)
(Code!Data)	REPLY (contrast is 64)	(CON!64)
(Code+Subcode!Data)	REPLY (PIP contrast is 64)	(BDR+PRTA!005 "57600")
(\$Code Data)	SET AND ACKNOWLEDGE MESSAGE (message processed?)	(\$CON64)
(&Code+Subcode Data Checksum)	SET WITH CHECKSUM	(&CON64 240)

What is sent in a message

Although you send and read messages as strings of ASCII characters, the actual message travels as a sequence of bytes. Each character in this sequence requires 1 byte. See the example below, which illustrates a *lamp limit is 2000 hours* reply from the projector.

ASCII =	(	L	P	L	!	2	0	0	0	)
HEX =	0x28	0x4	0x50	0x28	0x21	0x32	0x30	0x30	0x30	0x29

Maximizing message integrity

For additional reassurance and/or maximum message integrity, you can insert one or two special characters:

- **Acknowledgements:** If you want assurance from the projector (or group of projectors) that a set message has been processed, request an acknowledgement. The acknowledgement is returned after the message has been received and fully executed by the projector (such as in

the case of a source switch it is not sent until the switch is complete). If the message cannot be executed for some reason (such as invalid parameters, time-out, and so on) a NAK is returned instead (not-acknowledge). Requesting an acknowledgement serves no purpose when included in a request message, as the acknowledgement is redundant to the actual reply from the projector. However, if requested, the dollar sign (\$) acknowledgement from the projector follows the reply.

There are two types of acknowledgements:

- **Simple Acknowledgements:** Insert a dollar sign (\$) character just after the start code bracket. This only returns a \$. This only returns a dollar sign (\$) on success, or a caret (^) on failure (NAK).
- **Full Acknowledgements:** Insert a hash (#) character just after the start code bracket. This returns the message sent, as a reply.

This is a quick way to confirm success with set messages, and is particularly useful with long-distance communication links or where the projectors and/or images are not visible from the controller. Acknowledgements can also be a type of flow control.

- **Checksums:** For maximum message integrity, add a checksum character ampersand (&) just after the start code bracket. You must then also include the correct checksum total (0-255) just before the end code bracket. Make sure to add a space before the calculated checksum to separate it from the last data parameter:

The checksum is the low byte of the sum of the ASCII values of all characters between the start bracket and the beginning of the checksum, but not including either. It does include the space in front of the checksum. Calculate the checksum for the above *set contrast to 64* command as follows:

```
CHECKSUM EXAMPLE = & + c + o + n + 6 + 4 + 'space'
= 26h+63h +6Fh +6E h +36h +$34h +$20h
= 01F0h
= F0h when only the low byte is used
= 240
```

The projector collects all of the message bytes as defined in the first byte of the message, then creates its own checksum value for comparison with the checksum included in the controller's message. If the values match, the message is considered to have been correctly received; otherwise, the message is discarded.



- h indicates a hex number.
- If a request message has a checksum so does the reply.
- If using both acknowledge and checksum, either character can occur first.

Message errors

If a command cannot be performed (for example, syntax error), you receive a descriptive error indicating the problem. For example: (ITP)

```
(65535 00000 ERR00005 "ITP: Too Few Parameters")
```

For more examples of a descriptive error, see below.

Descriptive error

Error Code	Error Description	Error Code	Error Description
3	Invalid Parameter	107	Exceeded List Size
4	Too Many Parameters		
5	Too Few Parameters		
6	Channel not found	110	Communication Timeout
7	Command not executed	111	Communications Failure
8	Checksum error	112	Failed to set Hardware
9	Unknown request	113	Bad File
10	Error receiving serial data	114	Memory Failure
101	Control Not Found	115	Not Implemented
102	Subcontrol Not Found	116	Invalid Security Token
103	Wrong Control Type	117	Invalid Access Group
104	Invalid Value	118	System Busy - Try Again Later
105	Disabled Control		
106	Invalid Language		

Flow control

Normally messages can be sent to the projector before processing of earlier messages is complete—the projector stores messages in a buffer until ready to process. However, if a series of messages is sent, the projector may not be able to process them as fast as they arrive and the buffer becomes full. If this happens, the projector sends the 13h (Xoff) code to instruct the controller (or any devices preparing to transmit) to cease transmission. At this point, the controller must respond immediately and send no more than 10 extra characters or they may be lost (such as, the projector can accommodate the receipt of up to 10 more bytes after it sends 13h (Xoff)). When the buffer is once again available, the projector sends a 11h (Xon) command to resume transmission.



Xon and Xoff controls apply to both directions of communication. The projector does not send more than three characters after it has received a 13h (Xoff) code.

Boxer 4K30 Serial API

The Boxer 4K30 serial API commands can be used to modify projector settings.

Documentation Conventions

Convention	Description
Command Sequence Comment	Comment to provide sequence descriptions
(Command/subcode)	Command/subcode sent to the projector
(Response)	Response from the projector
<required arguments>	Mandatory argument for a serial command
[option arguments]	Optional argument for a serial command

ADR–Projector Address

Sets the projector address to target commands to a specific projector when communicating using the Christie Serial Protocol. This command also helps to identify where a response or asynchronous message originates from.

Generally, this command is used for projectors that are daisy-chained together using the RS232 style communication.

Commands

Command	Description	Values
ADR <value>	Sets the projector address to <value>. (Saved value)	0 to 999 65535 = Reserved broadcast address

Examples

Set all devices to address 0.

(65535 ADR 0)

Set first device at address 0 to address to 5.

(0 ADR 5)

Query address for all devices and return results to address 1001.

(65535 1001ADR?)

(01001 00005ADR!005)

ALC–Ambient Light Correction

Adjusts the image to help compensate for brighter or darker ambient light conditions.

Commands

Command	Description	Values
ALC <value>	Adjusts the image to help compensate for ambient light conditions. This command is only available if the video electronics are on. (Save value)	0 = No correction 1 to 100 = Adjusts the image for darker environments -1 to -100 = Adjusts the image for brighter environments

APW–Auto Power Up

Automatically powers up the projector to the On state if the projector was on when the AC power was lost.

For more information about the different power states, see [PWR–Power](#) on page 41.

Commands

Command	Description	Values
APW <0 1>	Automatically powers up the projector to the on state. (Saved value)	0 = Disables auto power up 1 = Enables auto power up

ASU–Auto Setup

Automatically readjusts various video controls for the active video source to produce an optimal image on screen.

Commands

Command	Description	Values
ASU	Automatically readjusts various video controls for the active video source to produce an optimal image on the screen. This command is only available if the active display has a signal.	-

Examples

Perform auto setup on the active video source.

(ASU)

BDR–Baud Rate

Sets the baud rate for any of the three serial ports on the projector.

Commands

Command	Description	Values
BDR+PRTA <value>	Sets the baud rate for the RS232-IN port. This command requires service level access. (Saved value)	1 = 2400 2 = 9600 3 = 19200 4 = 38400 5 = 57600 6 = 115200 (Default)

Examples

Set baud rate on port A to 115200 bits per second.

(BDR+PRTA 6)

Verify that RS232-IN is set to 115200bps.

(BDR+PRTA?)

(BDR+PRTA!006 "115200")

BGC–Base Gamma Curve

Applies a predefined gamma transfer function to the image.

Commands

Command	Description	Values
BGC <value>	Applies a predefined gamma transfer function to the image. This command is only available if the video electronics are on. (Saved value)	0 = sRGB (Default) 2 = Power Law Function 3 = M-Series (Standard) 4 = ITU-R BT.709

Examples

Select the sRGB gamma transfer function

(BGC 0)

Select a Power Law Function with a 2.6 Exponent.

(BGC 2)

(GAM 2600)

BST–Built-in Self Test

Performs a number of self-checks in the projector that can be safely executed either in standby, on, or cool down mode. Do not execute this command while the projector is warming up.

Commands

Command	Description	Values
BST?L	Returns a list of available test suites. (Read-only)	-
BST <suite>	Executes the test suite specified.	0 = All Tests 1 = Image processor board tests 2 = Formatter tests 3 = Active backplane tests 4 = Video path tests
BST+TEST?L	Returns a list of available tests. (Read-only)	-

Command	Description	Values
BST+TEST <index>	Executes the specified test.	0 = Video path: CRC check 1 = Video path: CRC check between option cards and input FPGA 2 = ABP/C4BP: Check FPGA voltages 3 = HIP: Check FPGA voltages 4 = HIP: Verify undefined pins 5 = HIP: Memory test 6 = CFB: Check FPGA voltages 7 = CFB138: Memory test 8 = CFB138: EEPROM test 9 = ABP: Test side channel to HIP 10 = HIP: Test side channels 11 = IMXB: CRC check LVDS from CPU to control FPGA 12 = IMXB: CRC check CPU HDMI output 13 = IMXB: Memory Test 14 = IMXB: Check FPGA voltage rails 15 = IMXB: Verify undefined pins

Examples

Retrieve list of test suites/tests as of v1.1.0 software.

(BST?L)

```
(BST!L001 001 00000 "All Tests")
(BST!L001 001 00001 "Image Processor Board Tests")
(BST!L001 001 00002 "Formatter Tests")
(BST!L001 001 00003 "Active Backplane Tests")
(BST!L001 001 00004 "Video Path Tests")
(BST!L111 "--END--")
```

(BST+TEST?L)

```
...
(BST+TEST!L001 001 00000 "ABP: Check FPGA voltages")
(BST+TEST!L001 001 00001 "HIP: Check FPGA voltages")
...
(BST+TEST!L111 "--END--")
```

Run all tests successfully.

(BST 0)

```
(BST!000 "--OK--")
```

Example of failed tests within the All Tests test suite:

(BST 0)

(BST!001 "Fail" "no response on pin 1")

(BST!002 "Fail" "no additional details")

(BST!000 "Fail")

Example of failing test 1:

(BST+TEST 1)

(BST+TEST!001 "Fail" "no response on pin 1")

CCA–Color Adjustment

Configures the color adjustments for the projector. Use this command to also set the native colors for the projector.

Commands

Command	Description	Values
CCA+SLCT <value>	Sets the color table. This command is only available if the video electronics are on. (Saved value)	0 = Max Drives Turns off all color adjustments, projector runs at maximum brightness 1 = Color Temperature Selects color adjustments based on a color temperature 2 = HD Video (ITU-R BT.709) 3 = Custom
CCA+CTMP <value>	Sets the color temperature of the projector. This command is only available if the video electronics are on, the projector is configured to use Color Temperature for its color table, and Color Temperature is selected. (Saved value)	3200 to 9300

Command	Description	Values
CCA+RDCX <x coordinate for red> CCA+RDCY <y coordinate for red> CCA+GNCX <x coordinate for green> CCA+GNCY <y coordinate for green> CCA+BLCX <x coordinate for blue> CCA+BLCY <y coordinate for blue> CCA+WHCX <x coordinate for white> CCA+WHCY <y coordinate for white>	Defines a custom color table using x,y coordinates, scaled by a factor of 10,000. For example, an x value of 3350 corresponds to x=0.3350 in the CIE 1931 chromaticity scale. This command is only available if the video electronics are on and Custom is selected. (Saved value)	The valid range for each value depends on which of the Red/Green/Blue point is being adjusted.
CCA+GOFR <green of red saturation value> CCA+BOFR <blue of red saturation value> CCA+ROFG <red of green saturation value> CCA+BOFG <blue of green saturation value> CCA+ROFB <red of blue saturation value> CCA+GOFB <green of blue saturation value>	Defines a custom color table using saturation values. Each control represents a percentage of each native RGB component needed to produce a target RGB space. This command is only available if the video electronics are on and Custom is selected. (Saved value)	-1000 to 1000, where 1000 = 100% A negative value reduces the influence of the component by scaling up the other two components.
CCA+ROFR <red of red saturation value> CCA+GOFG <green of green saturation value> CCA+BOFB <blue of blue saturation value>	Defines a custom color table using saturation values. Each control represents a percentage of each native RGB component needed to produce a target RGB space. • Red of red is equivalent to red of white. • Green of green is equivalent to green of white. • Blue of blue is equivalent to blue of white. This command is only available if the video electronics are on and Custom is selected. (Saved value)	0 to 1000, where 1000 = 100%

Command	Description	Values
CCA+ROFW <red of white saturation value> CCA+GOFW <green of white saturation value> CCA+BOFW <blue of white saturation value>	Defines a custom color table using saturation values. Each control represents a percentage of each native RGB component needed to produce a target RGB space. This command is only available if the video electronics are on and Custom is selected. (Saved value)	0 to 1000, where 1000 = 100%
CCA+RDPX <x coordinate for red> CCA+RDY <y coordinate for red> CCA+GNPX <x coordinate for green> CCA+GNPY <y coordinate for green> CCA+BLPX <x coordinate for blue> CCA+BLPY <y coordinate for blue> CCA+WHPX <x coordinate for white> CCA+WHPY <y coordinate for white>	Sets the native color primaries for the projector using the x,y coordinate form, scaled by a factor of 10,000. For example, an x value of 3350 corresponds to x=0.3350 in the CIE 1931 chromaticity scale. This command is only available if the video electronics are on and Max Drives is selected. It is only available to a service user.	The valid range for each value depends on which of the Red/Green/Blue/White point is being adjusted.
CCA+COPY <value>	Copies the values from one of the other pre-defined color tables into the custom color table. This command is only available if video electronics are on.	0 = Max Drives 1 = Color Temperature 2 = HD Video (ITU-RBT.709)
CCA+SAVE	Saves the current primary settings (for example, CCA+RDPX, and so on) as the new default color primary settings. Save these settings after calibrating the color primaries (such as measuring the primary x,y coordinates using a spectroradiometer or similar equipment). This command is only available if video electronics are on. It is only available to a service user.	
CCA+RSET	Resets the native color primary settings to their defaults. If primary settings have not been saved (CCA+SAVE), this resets the primary settings to hard-coded defaults. This command is only available if video electronics are on. It is only available to a service user.	-

Examples

Use a custom color table.

(CCA+SLCT 3)

Reset values to "HD Video (ITU-R BT.709)".

(CCA+COPY 2)

Change the x-coordinate of the custom color table to 0.6753.

(CCA+RDCX 6753)

Save the current color primary settings as the new calibrated defaults.

(CCA+SAVE)

Reset the color primary settings to the saved calibrated defaults.

(CCA+RSET)

CLE–Color Enable

Enables specific colors in the video path.

Commands

Command	Description	Values
CLE <color>	Enables specific colors in the video path. This command is only available if video electronics are on.	0 = White 1 = Red 2 = Green 3 = Blue 4 = Yellow 5 = Cyan 6 = Magenta

CSP–Color Space Selection

Changes the color space of the active signal on the screen.



This applies to all inputs.

Commands

Command	Description	Values
CSP <color space>	Changes the color space of the active signal on the screen. This command is only available if video electronics are on. (Saved value)	0 = Auto Detect—Uses the detected colorspace in the active signal. (Default) 1 = RGB (full range) 2 = RGB (limited range) 3 = YCbCr HDTV (ITU-R BT.709) 4 = YCbCr HDTV (expanded range)

Examples

Set the color space to RGB irrespective of which channel is selected.

(CSP 1)

Set the projector to always automatically detect the color space.

(CSP 0)

DDD—Disable Dual-Link DVI Inputs

Enables or disables the secondary DVI receiver on Dual-Link DVI cards.



This command applies to all Dual-Link DVI cards.

Commands

Command	Description	Values
DDD <0 1>	Enables or disables the secondary DVI receiver on Dual-Link DVI cards. This command is only available if video electronics are on. (Saved value)	0 = Enables Dual-Link support (Default) 1 = Disables Dual-Link support

DEF–Factory Defaults

Resets the projector to its factory default values.



Note the following about the command:

- Performing this command while the power is on does not reset the Lamp Selection value while in limited mode.
- Resets the network settings to be DHCP enabled.
- Deletes all user profiles, warps, and blends.

Commands

Command	Description	Values
DEF 111	Performs the factory default command.	111—Must be entered exactly as is

Examples

Reset the projector to factory defaults.

(DEF 111)

DTL–Sharpness

Adjusts the sharpness of scaled video to alter the amount of visible detail. This command does not affect unscaled video.

Commands

Command	Description	Values
DTL <value>	Adjusts the sharpness of scaled video to alter the amount of visible detail. This command is only available if video electronics are on. (Saved value)	0 to 100 Lower values = Soften the image 50 = Applies a moderate amount of filtering to the image (Default) Higher values = Sharpen the image

EBB–Black Level Blending

Selects the black level blend to use on the projector.

By default, black level blends are not on the projector. Use Twist (or Autocal) to add edge blends to the projector.

Commands

Command	Description	Values
EBB+SLCT?L	Retrieves a list of available black level blends.	-
EBB+SLCT <value>	Selects the black level blend to use on the projector. This command is only available if video electronics are on. (Saved value)	0 = Turns off black level blending (Default) 1 to 4 = Selects one of the four black level blends, if available

EBL–Edge Blending Selection

Selects the edge blend to use on the projector.

By default, edge blends are not on the projector. Use Twist (or Autocal) to add edge blends to the projector.

Commands

Command	Description	Values
EBL+SLCT?L	Retrieves a list of available edge blends.	-
EBL+SLCT <value>	Selects the edge blend to use on the projector. This command is only available if video electronics are on. (Saved value)	0 = Turns off edge blending 1 to 4 = Selects one of the four edge blends, if available

EDO–EDID Override

Configures which EDID is presented using inputs that support EDIDs (such as DisplayPort, HDMI, DVI, and so on).



Use this command to configure what the projector advertises regarding the type of signals it accepts. This command does not need to be set to accept a particular type of signal.

Commands

Command	Description	Values
EDO <rate>	Defines the expected frame rate regardless of the active window size of the signal. This command is only available if video electronics are on. (Saved value)	24 25 30 48 50 60 (Default)
EDO+COLM <value>	Defines the expected active window size of the incoming signal. This command is only available if video electronics are on. (Saved value)	0 = Auto Detect (Default) 1 = 4K—Columns 2x1 2 = 4K—Columns 4x1 3 = 4K - Quadrants 2x2

EME—Enable Asynchronous Serial Messages

Enables or disables the asynchronous serial messages that the projector occasionally transmits.

Commands

Command	Description	Values
EME <0 1>	Enables or disables asynchronous serial messages. (Saved value)	0 = Disables all asynchronous FYI/ERR serial messages 1 = Enables asynchronous FYI/ERR serial messages (Default)

ETP—Engine Test Pattern

Enables or disables the engine diagnostic test patterns.

Commands

Command	Description	Values
ETP <index>	Enables the engine diagnostic test patterns, indicated by the <index> parameter. This command is only available if video electronics are on.	0 = Flat Black 1 = Green 2 = Red 3 = Blue 4 = White 5 = 8x8 Green Checker 6 = 8x8 Red Checker 7 = 8x8 Blue Checker 8 = 8x8 White Checker 9 = Convergence Border & Cross (Green) 10 = Convergence Border & Cross (Red) 11 = Convergence Border & Cross (Blue) 12 = Convergence Border & Cross (White) 13 = Convergence Border & Cross (Multi-color) 14 = Convergence Border & Square (Green) 15 = Convergence Border & Square (Red) 16 = Convergence Border & Square (Blue) 17 = Top Blue, Bottom Black 18 = Left Blue, Right Black 19 = Top Green, Bottom Black 20 = Left Green, Right Black 21 = Top Red, Bottom Black 22 = Left Red, Right Black 29 = Convergence Border & Cross (Multi-color2) 45 = Convergence Border & Cross (Multi-color3) 235 = Moving Circles (Green) 236 = Moving Circles (Red) 237 = Moving Circles (Blue) 238 = Color Bars 239 = Edge Blend Grid (Green) 240 = Edge Blend Grid (Red) 241 = Edge Blend Grid (Blue) 242 = Edge Blend Grid (White) 243 = 17 Point

Command	Description	Values
		244 = Magenta 245 = Cyan 246 = Yellow 247 = Diagonal Lines 248 = Dark Segmented Ramp 249 = Bright Segmented Ramp 255 = Off

EVT–Event Manager

Retrieves a list of significant log messages for the current AC cycle from the projector.

Commands

Command	Description	Values
EVT	Returns all events starting from the most recent event on the projector back to AC start. (Read-only)	-
EVT <max>	Returns at most <max> events starting from the most recent event on the projector back to AC start. (Read-only)	max = Maximum number of events to return
EVT <start timestamp>	Returns all events from <start timestamp> back to current time. (Read-only)	start timestamp = String in the following format: yyyy=mm-dd hh:mm:ss
EVT <start timestamp> <end timestamp>	Returns all events from <end timestamp> back to <start timestamp>. (Read-only)	start timestamp = String in the following format: yyyy=mm-dd hh:mm:ss end timestamp = String in the following format: yyyy=mm-dd hh:mm:ss

Examples

Retrieve all events since last AC start.

(EVT)

```
(EVT!000 "2013-03-17 04:47:18.340" "OK" "Setting Time to 06:47:17")
(EVT!001 "2013-03-17 04:01:13.860" "Error" "(SST+TEMP?003) Lamp
    Exhaust Temperature (Temp 3) = Communication fault (shutdown)")
(EVT!002 "2013-03-17 04:01:13.855" "Error" "(SST+TEMP?002) Air
    Intake Temperature (Temp 2) = Communication fault (shutdown)")
(EVT!003 "2013-03-17 04:01:13.824" "Error" "(SST+TEMP?000) Integrator
    Rod Temperature (Temp 1) = Communication fault (shutdown)")
(EVT!004 "2013-03-17 04:01:12.663" "Error" "(SST+VERS?017) Lamp Power
    Supply Version = Detection fault")
(EVT!"--END--")
```

Retrieve two most recent events.

(EVT 2)

```
(EVT!000 "2013-03-17 04:47:18.340" "OK" "Setting Time to 06:47:17")
(EVT!001 "2013-03-17 04:01:13.860" "Error" "(SST+TEMP?003) Lamp
    Exhaust Temperature (Temp 3) = Communication fault (shutdown)")
(EVT!"--END--")
```

Retrieve all events from a specific point in time until now.

(EVT "2013-03-17 04:01:13")

```
(EVT!000 "2013-03-17 04:47:18.340" "OK" "Setting Time to 06:47:17")
(EVT!001 "2013-03-17 04:01:13.860" "Error" "(SST+TEMP?003) Lamp
    Exhaust Temperature (Temp 3) = Communication fault (shutdown)")
(EVT!002 "2013-03-17 04:01:13.855" "Error" "(SST+TEMP?002) Air
    Intake Temperature (Temp 2) = Communication fault (shutdown)")
(EVT!003 "2013-03-17 04:01:13.824" "Error" "(SST+TEMP?000) Integrator
    Rod Temperature (Temp 1) = Communication fault (shutdown)")
(EVT!"--END--")
```

Retrieve all events between two specific points in time.

(EVT "2013-03-17 04:01:08" "2013-03-17 04:01:12")

```
(EVT!004 "2013-03-17 04:01:12.663" "Error" "(SST+VERS?017) Lamp Power
    Supply Version = Detection fault")
(EVT!"--END--")
```

FCS–Lens Focus Position Adjustment

Sets the lens focus to an absolute position. This command is only enabled when the projector is on.

Commands

Command	Description	Values
FCS <position>	Adjusts the lens focus to the specified position. The position is persistent across AC cycles.	position = A numerical value that is subject to the range returned in FCS?m
FCS?m	Returns the minimum/maximum range of the zoom axis based on the last lens calibration performed. The returned range is persistent across AC cycles. (Read-only)	-

Examples

Move lens focus to position 500.

(FCS 500)

FRD–Frame Delay

Sets the delay between the input sync timing and the output sync timing, measured in $1/1000^{\text{ths}}$ of a frame (based on the input frame rate). The actual delay can vary based on the amount of processing applied to the image.

Commands

Command	Description	Values
FRD <delay>	Sets the frame delay, measured in $1/1000^{\text{ths}}$ of a frame. This command is only available if video electronics are on. (Saved value)	1000 to 3000 2000 = 2 frames (Default)
FRD+STAT?	Returns the actual frame delay in $1/1000^{\text{ths}}$ of a frame. This value may be higher than the required delay as the minimum allowed delay differs for each of the various channel configurations. (Read-only)	-
FRD+TIME?	Returns a string representation of the actual frame delay, in milliseconds. (Read-only) Note: This representation in milliseconds is approximate and is for reference only.	-

Examples

Set the frame delay to 2.25 frames.

(FRD 2250)

Set the frame delay to 1.1 frames.

(FRD 1100)

Query the actual frame delay.

(FRD+STAT?)

(FRD+STAT!1250)

Query the actual frame delay, in ms.

(FRD+TIME?)

(FRD+TIME!"33.33")

FRZ–Image Freeze

Freezes the active video or test pattern.

Commands

Command	Description	Values
FRZ <0 1>	Freezes the active video or test pattern. This command is only available if video electronics are on.	0 = Disable freezing of current video (Default) 1 = Freeze the current video

GAM–Gamma Power Value

Defines the exponent used in a standard Power Law Function. This command is only available if the base gamma curve is set to Power Law Function (see [BGC–Base Gamma Curve](#) on page 13 on page 8).

Commands

Command	Description	Values
GAM <exponent>	Sets the exponent for the power law function used for the gamma transfer function. This command is only available if video electronics are on. (Saved value)	1000 to 3000 2200 (Default)
GAM+SLOP <value>	Defines the slope of the linear section at the bottom of the curve.	1 to 100 1 (Default)
GAM+BLKA <value>	Adjusts the contrast ratio of the ITU-R BT.1886 gamma curve. The contrast ratio value is approximate. This command is only available if video electronics are on. (Saved value)	1000 to 5000 2000 (Default)

Examples

Set the base gamma curve function to 2.6

(GAM 2600)

Set the base gamma curve function to 1.0

(GAM 1000)

HIS—Lamp History

Retrieves a history of lamps installed in the projector, including the currently installed lamp. Each entry indicates lamp identification as well as various usage statistics collected while the lamp was installed.

The list is in reverse chronological order—meaning the first entry describes the current lamp, followed by the next most recent lamp, and so on, up to a maximum of 50 total entries.

Commands

Command	Description	Values
HIS?	Returns a list of entries in the lamp history.	Each entry has the following format: <i><entry number> <install date> <serial #> <lamp type> <strikes> <failed strikes> <failed re-strikes> <unexpected lamp offs> <pre-installation hours> <total lamp hours></i> Entry Number—Unique number identifying the entry Install Date—Date that the lamp entry was created Serial #—Serial number of the lamp (an arbitrary string) Lamp Type—Type of lamp used Strikes—Number of lamp strikes performed for this entry Failed Strikes—Number of failed strikes that occurred for this entry Failed Re-strikes—Number of times the lamp failed a re-strike for this entry Unexpected Lamp Offs—Number of times the lamp unexpectedly turned off for this entry Pre-installation Hours—Number of hours that this lamp has been on, prior to being installed in the projector Total Lamp Hours—Total number of hours (including the pre-installation hours) that the lamp has been on

Command	Description	Values
HIS+LMP1	Returns all the entries found in the lamp memory module.	Each entry has the following format:
HIS+LMP2		<i><entry number> <install date> <serial #> <lamp type></i>
HIS+LMP3		<i><strikes> <failed strikes> <unexpected lamp offs> <pre-installation hours> <total lamp hours></i>
HIS+LMP4		Entry Number—An unique number identifying the entry
HIS+LMP5		Install Date—Date that the lamp entry was created
HIS+LMP6		Serial #—Serial number of the lamp (an arbitrary string)
		Lamp Type—Type of lamp used
		Strikes—Number of lamp strikes performed for this entry
		Failed Strikes—Number of failed strikes that occurred for this entry
		Unexpected Lamp Offs—Number of times the lamp unexpectedly turned off for this entry
		Pre-installation Hours—Number of hours that this lamp has been on, prior to being installed in the projector
		Total Lamp Hours—Total number of hours (including the pre-installation hours) that the lamp has been on

Examples

Return the list of all lamps that have been installed in the projector.

(HIS?)

```
(HIS!0000 "2015/05/19 09:37:50" "New_May15" "" 0094 0000 0000 0000 0153)
```

```
(HIS!0001 "2015/04/27 15:03:10" "NewA2_Mar30" "" 0343 0000 0000 0505 0513)
```

...

```
(HIS!0049 "2015/02/12" "Lamp4" "" 0000 0000 0000 0004 0000)
```

Return the list of entries in the Lamp A1 Lamp Memory Module

(HIS+LMP1?)

```
(HIS+LMP1!0000 "2015/05/19 09:37:50" "New_May15" "" 0094 0000 0000 0000 0153)
```

ITP—Internal Test Pattern

Enables or disables test patterns.

Commands

Command	Description	Values
ITP <index>	Enables or disables test patterns. This command is only available if video electronics are on.	0 = Off 1 = Grid 2 = Grey Scale 16 3 = Flat White 4 = Flat Grey 5 = Flat Black 6 = Checker 7 = 17 Point 8 = Edge Blend 9 = Color Bars 10 = Multi Color 11 = RGBW Ramp 12 = Horizontal Ramp 13 = Vertical Ramp 14 = Diagonal Ramp 15 = Square Grid 16 = Diagonal Grid 17 = Prism/Convergence 18 = Maximum Activity 19 = FLIR 20 = Focus Fidelity 21 = Boresight 22 = Convergence 23 = Integrator Rod 24 = Flare
ITP+FREQ <value>	Sets the frequency at which the internal test patterns are displayed. This command is only available if video electronics are on.	24 to 500 60 (Default)
ITP+GREY <grey level>	Defines the shade of grey for the Flat Grey test pattern. This command is only available if video electronics are on.	0 to 4095 2048 (Default)
ITP+RMPM <speed>	Defines the motion speed used for the Horizontal Ramp, Vertical Ramp, and Diagonal Ramp test patterns. This command is only available if video electronics are on.	0 to 100 0 (Default)
ITP+RMPS <slope>	Defines the slope used for the Horizontal Ramp, Vertical Ramp, and Diagonal Ramp test patterns. This command is only available if video electronics are on.	1 to 5 1 (Default)

Command	Description	Values
ITP+RMPL <grey level>	Defines the starting (top/left) grey-level used for the Horizontal Ramp, Vertical Ramp, and Diagonal Ramp test patterns. This setting has no effect when the ramp is moving (such as ITP+RMPM is non-zero). This command is only available if video electronics are on.	0 to 4095 0 (Default)
ITP+GRDP <pitch>	Defines the spacing between lines used for the Square Grid and Diagonal Grid test patterns. This command is only available if video electronics are on.	2 to 127 32 (Default)
ITP+GRDC <0 1>	Enables multi-color or white-on-black grids for the Square Grid or Diagonal Grid test patterns. This command is only available if video electronics are on.	0 = Multi-color (Default) 1 = White-on-black
ITP+GRDM <0 1>	Enables moving or static grid for the Square Grid or Diagonal Grid test patterns. This command is only available if video electronics are on.	0 = Static (Default) 1 = Moving

KEN–Keypad Enable

Enables or disables the IR or wired keypad sensors.

Commands

Command	Description	Values
KEN+FRNT <0 1>	Enables or disables the IR keypad sensor. (Saved value)	0 = Disables the front IR keypad sensor 1 = Enables the front IR keypad sensor (Default)
KEN+REAR <0 1>	Enables or disables the rear IR keypad sensor. (Saved value)	0 = Disables the rear IR keypad sensor 1 = Enables the rear IR keypad sensor (Default)
KEN+WIRE <0 1>	Enables or disables the wired keypad sensor. (Saved value)	0 = Disables the wired keypad jack 1 = Enables the wired keypad jack (Default)
KEN+HDBT <0 1>	Enables IR over HDBaseT. (Saved value)	0 = Disables IR over HDBaseT (Default) 1 = Enables IR over HDBaseT

Examples

Get current wired jack enabled state.

(KEN+WIRE?)

Disable front IR sensor.

(KEN+FRNT 0)

Disable the rear IR sensor.

(KEN+REAR 1)

LCB–Lens Motor Calibration

Calibrates all of the lens motors. This command is only enabled when the projector is on.

Commands

Command	Description	Values
LCB 1	Runs calibration on all lens motors.	-
LCB+HOME	Moves all lens motors back to the center flag for each axis and sets their respective positions to 0.	-
LCB+ZOOM 1	Calibrates the zoom motor.	-

Examples

Start calibration:

(LCB 1)

Move the lens back to the home position:

(LCB+HOME)

LHO–Lens Horizontal Position Adjustment

Sets the lens horizontal location to an absolute position. This command is only available when the projector is on.

Commands

Command	Description	Values
LHO <position>	Adjusts the horizontal location of the lens to the specified position. (Saved value)	position = Numerical value subject to the range returned in LHO?m

Command	Description	Values
LHO?m	Returns the minimum/maximum range of the zoom axis based on the last lens calibration performed. The returned range is persistent across AC cycles. (Read-only)	-

Examples

Move the lens to position 500 on the horizontal axis.

(LHO 500)

LMV–Lens Move

Adjusts all aspects of the lens position using a single command. It can also be used to move the lens to a relative position or to start and stop the motors arbitrarily.

Commands

Command	Description	Values
LMV <horizontal> <vertical> <zoom> <focus>	Moves the lens to an absolute position as specified by each of the four arguments.	Minimum/maximum of each axis = Dependent on the projector and the installed lens Maximum horizontal range = -1600 to 1600 Maximum vertical range = -1600 to 1600
LMV+HSTP <relative steps>	Moves the horizontal motor a relative number of steps.	negative steps = Moves the display down positive steps = Moves the display up The maximum absolute value is dictated by the motor's current location and the range of the axis (see the LMV command above).
LMV+VSTP <relative steps>	Moves the vertical motor a relative number of steps.	negative steps = Moves the display down positive steps = Moves the display up The maximum absolute value is dictated by the motor's current location and the range of the axis (see the LMV command above).

LMV+FSTP <relative steps>	Moves the focus motor a relative number of steps.	negative steps = Focuses inward positive steps = Focuses outward The maximum absolute value is dictated by the motor's current location and the range of the axis (see the LMV command above).
LMV+ZSTP <relative steps>	Moves the zoom motor a relative number of steps.	negative steps = Makes the display larger positive steps = Makes the display smaller The maximum absolute value is dictated by the motor's current location and the range of the axis (see the LMV command above).
LMV+HRUN <-1 0 1>	Starts and stops the horizontal motor.	-1 = Moves the display left 0 = Stops the motor 1 = Moves the display right
LMV+VRUN <-1 0 1>	Starts and stops the vertical motor.	-1 = Moves the display down 0 = Stops the motor 1 = Moves the display up
LMV+FRUN <-1 0 1>	Starts and stops the focus motor.	-1 = Moves the display inward 0 = Stops the motor 1 = Moves the display outward
LMV+ZRUN <-1 0 1>	Starts and stops the zoom motor.	-1 = Makes the display larger 0 = Stops the motor 1 = Makes the display smaller

Examples

Set the lens to H:1000, V:1500, Z:500, F:500.

(LMV 1000 1500 500 500)

Start to move horizontal motor toward positive max position.

(LMV+HRUN 1)

Stop the vertical motor.

(LMV+VRUN 0)

Start moving the zoom motor towards the negative max position.

(LMV+ZRUN -1)

Move the horizontal motor 45 steps in the positive direction.

(LMV+HSTP 45)

LOE–Video Loop Out Enable

Enables or disables video loop out on the following cards: THIC, 3GIC, and TDPIC.

Commands

Command	Description	Values
LOE <0 1>	Enables or disables video loop out. This command is only available if video electronics are on and it only applies to option cards that have loopout. (Saved value)	0 = Disables video loop out 1 = Enables video loop out (Default)

LOP–Lamp Selection

Selects a lamp to turn on or off while in limited power mode.

Commands

Command	Description	Values
LOP <lamp>	Selects a lamp to turn on or off while in limited power mode. This command is disabled while in the Power On state. (Saved value)	1 = Lamp A1 (Default) 2 = Lamp A2 3 = Lamp A3 4 = Lamp B1 5 = Lamp B2 6 = Lamp B3

LPL–Lamp Life

Sets the expected lamp life in hours. If the lamp run time exceeds this value, a warning is displayed in the status system.

The lamp run time is equal to the lamp's original lamp hours plus the amount of time it has been on while installed in the projector.

Commands

Command	Description	Values
LPL <hours>	Sets the number of hours before a warning is displayed in the status system about the lamp needing to be replaced. (Saved value)	Positive number 0 = Disables the lamp end-of-life check (Default)

Examples

Set the lamp end of life indicator to 1000 hours.

(LPL 1000)

Disable the lamp life monitoring.

(LPL 0)

LPP–Lamp Power

Adjusts the amount of power going to the lamps.

Commands

Command	Description	Values
LPP <percentage>	Sets the amount of power going to the lamps as a percentage of maximum power.	80 to 100 100 (Default)

LVO–Lens Vertical Position Adjustment

Sets the lens vertical location to an absolute position. This command is only enabled when the projector is on.

Commands

Command	Description	Values
LVO <position>	Adjusts the vertical location of the lens to the specified position. This position is persistent across AC cycles. (Saved value)	position = A numerical value that is subject to the range returned in LVO?m
LVO?m	Returns the minimum/maximum range of the vertical axis based on the last lens calibration performed. The returned range is persistent across AC cycles. (Read-only)	-

Examples

Move the lens to position 500 on the vertical axis.

(LVO 500)

NET–Network Setup

Changes the network configuration for the Ethernet port. By default, DHCP support is turned on.

Commands

Command	Description	Values
NET <ip> <subnet> [gateway]	Sets the projector network settings as specified. (Saved value)	All three arguments are strings and the gateway is optional.
NET+DGRP <group>	Sets the device group name for the projector. (Saved value) This can help simplify broadcast searching by organizing projectors into groups, particularly if a large number of projectors are on the same local network.	-
NET+DHCP 1	Enables DHCP. To turn off DHCP support, switch to a static IP by using the base command. (Saved value)	-
NET+ETH0?	Returns the projector IP address. (Read-only)	-
NET+GATE?	Returns the projector gateway address. (Read-only)	-

Command	Description	Values
NET+HOST <name>	Sets the name for the projector. With this set, devices on the same network subnet as the projector can connect to it using the name: <name>.local. (Saved value)	-
NET+MAC0?	Returns the MAC address of the Ethernet port. (Read-only)	-
NET+PORT?	Returns the TCP port used for the Christie Serial Protocol over Ethernet. (Read-only)	1024 to 49151 (with some exceptions) 3003 = Reserved on the projector and cannot be used for the Christie Serial Protocol
NET+SUB0?	Returns the projector netmask. (Read-only)	-

Examples

Set the static IP address to 192.168.1.100, with a netmask of 255.255.255.0, and no gateway:

(NET "192.168.1.100" "255.255.255.0")

Turn on DHCP support:

(NET+DHCP 1)

OSD—On Screen Display

Displays or hides the on-screen display.

Commands

Command	Description	Values
OSD <0 1>	Turns on or off the on-screen display.	0 = Hides the on-screen display 1 = Displays the on-screen display (Default)

OTR—Output Resolution

Returns the maximum number of columns and rows for the display.

Commands

Command	Description	Values
OTR+HRES?	Returns the maximum number of columns for the display. Always returns 4096. (Read-only)	-
OTR+VRES?	Returns the maximum number of rows for the display. Always returns 2160. (Read-only)	-

PNG-Ping

Returns basic projector information to the user, including the type of device and main software version.

Commands

Command	Description	Values
PNG?	Returns basic projector information (Read-only): <type> <major> <minor> <build> where Type = type of projector Major, Minor, Build = Software version	type valid values: 54 = D4K-60, Mirage 4K 55 = Boxer 4K30

Examples

Send a ping.

(PNG?)

(PNG!054 001 001 000)

PRO-Profile

Allows selection of a local profile on the projector.

Commands

Command	Description	Values
PRO?L	Returns the list of available local profiles. (Read-only)	-

PRO x	Selects local profile x and applies the profile to the projector. Selecting an empty profile does not do anything.	0 = Default 1 = <custom 1> 2 = <custom 2> 3 = <custom 3> 4 = <custom 4>
-------	---	---

PWR–Power

Turns the projector power on and off.

Commands

Command	Description	Values
PWR <0 1>	Turns the projector on or off.	0 = Turns the projector off 1 = Turns the projector on
PWR+ELEC <0 1>	Keep video electronics on in standby, regardless of lamp state.	0 = Disables electronics override 1 = Enables electronics override
PWR?	Returns the current power state of the projector (Read-only): 000 = Standby 011 = Warming up 001 = On 010 = Cooling down	-

Examples

Turn on the projector.

(PWR 1)

Turn off the projector.

(PWR 0)

Return current state of the power to the projector.

(PWR?)

(PWR!000 "Power Off")

RAL–Remote Access Level

Sets the default remote serial protocol access level for any of the serial ports.

Commands

Command	Description	Values
RAL < value>	Sets the access level on all Ethernet port. (Saved value)	0 = No Access—Disables the port 1 = Login Required—Sets read-only access until a separate login is performed
RAL+PRTA <value>	Sets the access level for the RS232 port. (Saved value)	2 = Free Access—Executes commands at the operator level unless a separate login is performed (Default)

Examples

Set port to Login Required.

(RAL+PRTC 1)

SHU–Shutter

Opens and closes the shutter. It can also be used check if the shutter is currently opened or closed.



This command may return an incorrect result if the shutter was manually opened or closed.

Commands

Command	Description	Values
SHU <0 1>	Opens or closes the shutter.	0 = Opens the shutter 1 = Closes the shutter (Default)

Examples

Open the shutter.

(SHU 0)

Close the shutter.

(SHU 1)

Get the state of the shutter (0 for open, 1 for closed).

(SHU?)

SIN–Select Input

Selects a set of inputs based on the selected port configuration.

Commands

Command	Description	Values
SIN <input>	Selects a set of inputs based on the selected port configuration. This command is only available if video electronics are on. (Saved value)	The list of available values is dynamic. Run SIN?L to retrieve the currently available list.
SIN?L	Returns a list of available inputs to select based on the selected port configuration. (Read-only)	-
SIN+PORT <config>	Select an input port configuration to use. This command is only available if video electronics are on. (Saved value)	1 = One-Port (Default) 2 = Two-Port 3 = Four-Port Columns 4 = Four-Port Quadrants

Examples

Use four DDICs to display a Four-Port Quadrant image.

(SIN+PORT 4)

(\$SIN 3)

Try to select an unavailable input because there is only one TDPIIC in the projector.

(SIN+PORT 4)

(\$SIN 1)

SOR–Screen Orientation

Changes the orientation of the displayed image.

Commands

Command	Description	Values
SOR <value>	Changes the orientation of the displayed image. This command is only available if video electronics are on. (Saved value)	0 = Front Projection (Default) 1 = Rear Projection 2 = Front Projection Inverted 3 = Rear Projection Inverted

SPS–Splash Screen

Changes the characteristics of the displayed splash screen when there is no signal.

Commands

Command	Description	Values
SPS+COLR <value>	Changes the background color of the splash screen. This command is only available when video electronics are on. (Saved value)	1 = Red 2 = Green 3 = Blue 7 = Black (Default)

SST–Status

Returns status information about the projector in read-only mode. See the Status System documentation for a list of items and their possible values.

Each item is listed in the following format:

(SST+<group>!<index> <state> "<value>" "<description>")

where:

- <group> is the four letter identifier of the status system group the item belongs to.
- <index> is the index value of the status item within the group.
- <state> is the condition of the status item:
 - 000 = OK
 - 001 = Warning
 - 002 = Error
- <value> is the value of the status item.
- <description> is the descriptive name of the status item.

Commands

Command	Description	Values
SST?	Returns all status items.	-
SST+<group>?	Returns all status items within the specified four-letter group identifier.	-
SST+<group>?<index>	Returns a specific status item within the specified four-letter group identifier.	-

Examples

The following example was reduced for brevity.

(SST+TEMP?)

...

(SST+TEMP!000 000 "21 °C" "Integrator Rod Temperature (Temp 1)")

(SST+TEMP!002 000 "21 °C" "Air Intake Temperature (Temp 2)")

(SST+TEMP!003 000 "21 °C" "Lamp Exhaust Temperature (Temp 3)")

(SST+TEMP!020 000 "28 °C" "Environmental Board Temperature")

...

Return item 20 of the temperature group.

(SST+TEMP?20)

(SST+TEMP!020 000 "28 °C" "Environmental Board Temperature")

SZP–Resize Presets

Changes the aspect ratio of the display.

By default, the projector scales all video to the full screen with the exception of 16:9 content. 16:9 content is scaled to 3840x2160 with black pillar boxes on either side.

Commands

Command	Description	Values
SZP <value>	Changes the aspect ratio of the display. This command is only available if video electronics are on. (Saved value)	0 = Allows the projector to determine when to scale video (Default) 1 = None 2 = Full size (stretch horizontally and vertically) 3 = Full width (stretch horizontally) 4 = Full height (stretch vertically)

TMD–Time and Date

Sets the date and time in the real-time clock.

Commands

Command	Description	Values
TMD+TIME <time>	Sets the time for the clock.	time = String in the following format: hh:mm:ss

Command	Description	Values
TMD+DATE <date>	Sets the date for the clock.	date = String in the following format: YYYY/MM/DD

Examples

Get the local time.

(TMD+TIME?)

Set the time to 3pm.

(TMD+TIM "15:00:00")

(65535 00000 FYI0916 "Setting Time to 15:00:00")

Get the date to January 17th, 2015

(TMD+DATE "2015/01/17")

(65535 00000 FYI--916 "Setting Date to 2015/01/17")

UID–User ID

Changes the access level of the currently connected session.

Commands

Command	Description	Values
UID <username> <password>	Logs in using the specified user name and password.	-

Examples

Login as service using the default password.

(UID "service" "service")

WRP–Warp Selection

Selects the warp map to use on the projector.

By default, warp maps are not on the projector. Use Twist (or Autocal) to add warp maps to the projector.

Commands

Command	Description	Values
WRP+SLCT?	Retrieves a list of available warp maps. (Read-only)	-
WRP+SLCT <value>	Changes the warp map to use on the projector. This command is only available if video electronics are on. (Saved value)	0 = Turns off warping 1-4 = Selects one of four warp maps, if available

ZOM–Lens Zoom Position Adjustment

Sets the lens zoom to an absolute position. This requires a zoom motor on the lens for it to work. This command is only available when the projector is on.

Commands

Command	Description	Values
ZOM <position>	Adjusts the lens zoom to the specified position. (Saved value)	position = A numerical value that is subject to the range returned in ZOM?m
ZOM?m	Returns the current minimum and maximum values for the zoom position based on the last lens calibration performed. (Read-only)	-

Examples

Get the current minimum/maximum values for the zoom axis.

(ZOM?m)

(ZOM!M-2400 900)

Move the lens to position 500 for the zoom motor.

(ZOM 500)

Asynchronous messages

The projector can generate some asynchronous messages. The following lists examples of each message, including why and when they are generated.



Bolded and underlined text indicates a fixed part of the message.

Type	Message	Description
Card Detected	(<u>65535 00000 FYI01901 "Card x detected"</u>)	Triggered when a new card is detected in slot X while the video electronics are already on.
Card Removed	(<u>65535 00000 FYI01901 "Card x removed"</u>)	Triggered when a card is removed from slot X while the video electronics are on.
Date/Time	(<u>65535 00000 FYI00916</u> "Setting Date to 2015/05/20")	Generated when the date or time are changed, respectively.
	(<u>65535 00000 FYI00916</u> "Setting Time to 00:00:00")	
Factory defaults	(<u>65535 00000 FYI00919</u> "All settings have been restored to their factory defaults. Reboot is required to take effect.")	Generated when a factory default has been performed on the projector.
Networking	(<u>65535 00000 FYI00915</u> "Configured network: IP:192.168.228.6 Mask:255.255.252.0 Gateway:192.168.228.1")	Generated when the network settings have changed. Network settings can change due to a number of specific events such as: • Operator changes the network settings (through any of the standard interfaces). • DHCP lease is renewed. • The network cable has been unplugged or plugged in.
Status	(<u>65535 00000 FYI00000</u> "(<u>SST</u> +LAMP?001) Lamp Hours = 00:00 (h:m)")	Generated when a status item changes from: • An error or warning state to an OK state • An OK or error state to a warning state. • An OK or warning state to an error state.
	(<u>65535 00000 ERR00000 "System Warning: (<u>SST</u>+LAMP?001) Lamp Hours = N/A"</u>)	
	(<u>65535 00000 ERR00000 "System Error: (<u>SST</u>+VERS?003) Image Processor HW Version = Detection Fault"</u>)	

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