

Technical Reference

020-101698-01

Mirage 4KLH Serial API Commands

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Mirage 4KLH Serial API

The Mirage 4KLH 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 |
| <i>(Response)</i> | 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>. | 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. | 0 = No correction 1 to 100 = Adjusts the image for darker environments -1 to -100 = Adjusts the image for brighter environments |

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 | Performs auto setup on the active video source. | - |

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. | 1 = 2400 2 = 9600 |
| BDR+PRTB <value> | Sets the baud rate for the RS232-OUT port. | 3 = 19200 4 = 38400 |
| BDR+PRTC <value> | Sets the baud rate for the RS422 port. | 5 = 57600 6 = 115200 (Default baud rate on each port) |

Examples

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

(**BDR+PRTA 6**)

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. Note: The Power Law Function is defined by the GAM—Gamma Power Law Exponent command. | 0 = sRGB (Default) 1 = ITU-R BT.709 2 = Power Law Function |

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, where <suite> is numerical. | suite = One of the indices from BST?L |
| BST+TEST?L | Returns a list of available tests. (Read-only) | - |
| BST+TEST <index> | Executes the specified test. | index = One of the indices from BST+TEST?L |

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!L001 001 00002 "HIP: Verify Undefined pins")
(BST+TEST!L001 001 00003 "HIP: Memory Test")
(BST+TEST!L001 001 00004 "CFB138: Check FPGA voltages")
(BST+TEST!L001 001 00005 "CFB138: Memory Test")
(BST+TEST!L001 001 00006 "CFB138: EEPROM Test")
(BST+TEST!L001 001 00007 "ABP: Test side channel to HIP")
(BST+TEST!L001 001 00008 "HIP: Test side channel between scaler and the warp, CFB, and
between the warp & CFB")
(BST+TEST!L001 001 00009 "Video Path: CRC check between option cards an input FPGA")
(BST+TEST!L001 001 00010 "Video Path: CRC check between input FPGA and the formatters")
(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. | 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-RBT.709) 3 = Custom settings |
| CCA+CTMP <value> | Sets the color temperature of the projector. This is only available if the projector is configured to use Color Temperature for its color table. | 3200 to 9300 |
| 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. | The valid range for each value depends on which of the Red/Green/Blue point is being adjusted. |

| Command | Description | Values |
|--|---|---|
| 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. | -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. <ul style="list-style-type: none"> • 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. | 0 to 1000, where 1000 = 100% |
| 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. | 0 to 1000, where 1000 = 100% |
| CCA+RDPX <x coordinate for red> CCA+RDPY <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. | 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. | 0 = Max Drives 1 = Color Temperature 2 = HD Video (ITU-RBT.709) |

| Command | Description | Values |
|----------|---|---|
| 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). | 0 = Disable the function 1 = Enable the function |
| 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. | - |

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)

CHA-Channel

Changes the current channel.

Commands

| Command | Description | Values |
|---------------|---------------------------------------|--|
| CHA?L | Returns a list of available channels. | - |
| CHA <channel> | Selects a specified channel. | channel = One of the indices listed in CHA?L |

Examples

Retrieve the list of available channels.

```
(CHA?1)
(CHA!L001 001 00001 "Four-Port (slot 1,2)")
(CHA!L001 001 00002 "Four-Port (slot 3,4)")
(CHA!L001 001 00003 "Four-Port (slot 1,2,3,4) (120Hz)")
(CHA!L001 001 00004 "Four-Port, Dual-Input 3D (slot 1,2,3,4) (120Hz)")
(CHA!L001 001 00011 "Two-Port (slot 1,2)")
(CHA!L001 001 00012 "Two-Port (slot 3,4)")
(CHA!L001 001 00017 "Two-Port, Dual-Input 3D (slot 1,2)")
(CHA!L001 001 00018 "Two-Port, Dual-Input 3D (slot 3,4)")
(CHA!L001 001 00019 "Two-Port, Dual-Input 3D (slot 1,2,3,4) (120Hz)")
(CHA!L001 001 00021 "One-Port (slot 1)")
(CHA!L001 001 00022 "One-Port (slot 2)")
(CHA!L001 001 00023 "One-Port (slot 3)")
(CHA!L001 001 00024 "One-Port (slot 4)")
(CHA!L001 001 00025 "One-Port, Dual-Input 3D (slot 1)")
(CHA!L001 001 00026 "One-Port, Dual-Input 3D (slot 2)")
(CHA!L001 001 00027 "One-Port, Dual-Input 3D (slot 3)")
(CHA!L001 001 00028 "One-Port, Dual-Input 3D (slot 4)")
(CHA!L001 001 00029 "One-Port, Dual-Input 3D (slot 1,2)")
(CHA!L001 001 00030 "One-Port, Dual-Input 3D (slot 3,4)")
(CHA!L111 "--END--")
```

CLE–Color Enable

Enables specific colors in the video path.

Commands

| Command | Description | Values |
|-------------|--|---|
| CLE <color> | Enables specific colors in the video path. | 0 = White (all colors on) 1 = Red 2 = Green 3 = Blue 4 = Yellow (red and green on) 5 = Cyan (green and blue on) 6 = Magenta (red and blue on) |

CSP—Color Space Selection

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



This applies to any channel selected, not per channel.

Commands

| Command | Description | Values |
|-------------------|---|---|
| CSP <color space> | Changes the color space of the active signal on the screen. | 0 = Auto Detect—Automatically sets the color space based on information in the signal. (Default) 1 = RGB—Forces the color space to RGB regardless of what is detected in the signal. 2 = YCbCr HDTV (ITU-RBT.709)—Forces the color space to YCbCr HDTV regardless of what is detected in the signal. 3 = RGB (Limited 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)

DEF—Factory Defaults

Resets the projector to its factory default values.



Note the following about the command:

- Only available while the projector is in standby or cooling down.
- The projector must be AC cycled for this command to take effect.

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)

```
(65535 00000 FYI00919 "All settings have been restored to their factory defaults.
Reboot is required to take effect.")
```

DRK-3D Dark Interval

Examples

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. | 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. | 0 = Turns off black level blending 1-4 = 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. | 0 = Turns off edge blending 1-4 = 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. | 24 25 30 48 50 60 (Default) 120 |

| Command | Description | Values |
|------------------|---|--|
| EDO+COLM <value> | Defines the expected active window size of the incoming signal. | 0 = Standard (quadrants) (2048x1080 / 1920x1080) 1 = Two Column (2048x2160 / 1920x2160) 2 = Four Column (1024x2160 / 960x2160) |

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. | 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. | 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) |

| Command | Description | Values |
|---------|-------------|--|
| | | 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) (green/red colors are swapped) 45 = Convergence Border & Cross (Multi-color3) (green/blue colors are swapped) 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 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. The timestamp has a format of yyyy-mm-dd hh:mm:ss. (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>. The timestamps have a format of yyyy-mm-dd hh:mm:ss. (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 requires a focus motor on the lens for it to work.

Commands

| Command | Description | Values |
|----------------|---|---------------|
| FCS <position> | Adjusts the lens focus to the specified position. | -2000 to 2800 |

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^{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 ^{ths} of a frame. | 1000 to 3000 2000 = 2 frames(Default) |
| FRD+STAT? | Returns the actual frame delay in 1/1000 ^{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. If 3D processing is used, the left and right eye delay may be different from each other and each delay is reported individually. 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")

Query the actual frame delay for a Dual-Input 3D configuration, in ms.

(FRD+TIME?)

(FRD+TIME! "33.33 (L), 41.67 (R)")

FRZ–Image Freeze

Freezes the active video or test pattern.

Commands

| Command | Description | Values |
|-------------|---|---|
| FRZ <0 1> | Freezes the active video or test pattern. | 0 = Disable freezing of current video 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 7).

Commands

| Command | Description | Values |
|----------------|--|--------------|
| GAM <exponent> | Sets the exponent for the power law function used for the gamma transfer function. | 1000 to 3000 |

Examples

Set the base gamma curve function to 2.6

(**GAM 2600**)

Set the base gamma curve function to 1.0

(**GAM 1000**)

ITP–Internal Test Pattern

Enables or disables test patterns.

Commands

| Command | Description | Values |
|-----------------------|--|--|
| ITP <index> | Enables or disables test patterns. | 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 |
| ITP+GREY <grey level> | Defines the shade of grey for the Flat Grey test pattern. | 0 to 4095 2048 (Default) |
| ITP+RMPM <speed> | Defines the motion speed used for the Horizontal Ramp, Vertical Ramp, and Diagonal Ramp test patterns. | 0 (Default) to 100 |
| ITP+RMPS <slope> | Defines the slope used for the Horizontal Ramp, Vertical Ramp, and Diagonal Ramp test patterns. | 1 (Default) to 5 |
| 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). | 0 (Default) to 4095 |
| ITP+GRDP <pitch> | Defines the spacing between lines used for the Square Grid and Diagonal Grid test patterns. | 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. | 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. | 0 = Static (Default) 1 = Moving |

LCB–Lens Motor Calibration

Calibrates all of the lens motors.

Commands

| Command | Description | Values |
|----------|--|--------|
| LCB 1 | Runs calibration on all lens motors. | - |
| LCB+HOME | Moves the lens to position 0 along the horizontal and vertical axes. | - |

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.

Commands

| Command | Description | Values |
|----------------|--|---------------|
| LHO <position> | Adjusts the horizontal location of the lens to the specified position. | -1600 to 1600 |

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. | Horizontal maximum range = -1600 to 1600 Vertical maximum range = -1600 to 1600 Zoom/focus maximum = Dependent on type of lens and calculated during lens calibration |
| LMV+HSTP <relative steps> LMV+VSTP <relative steps> LMV+FSTP <relative steps> LMV+ZSTP <relative steps> | Moves the lens a relative number of steps on the specified axis. HSTP = Horizontal VSTP = Vertical FSTP = Focus ZSTP = Zoom | steps = Either negative or positive numbers The maximum absolute value is dictated by the motor's current location and the range of the axis (see the LMV command). |
| LMV+HRUN <-1 0 1> LMV+VRUN <-1 0 1> LMV+FRUN <-1 0 1> LMV+ZRUN <-1 0 1> | Starts and stops each motor: HRUN = Horizontal VRUN = Vertical FRUN = Focus ZRUN = Zoom | -1 = Moves the motor in reverse 0 = Stops the motor 1 = Moves the motor forward |

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. Note: Applies to all of the option cards in the projector. | 0 = Disables video loop out 1 = Enables video loop out (Default) |

LVO–Lens Vertical Position Adjustment

Sets the lens vertical location to an absolute position.

Commands

| Command | Description | Values |
|----------------|--|---------------|
| LVO <position> | Adjusts the vertical location of the lens to the specified position. | -1600 to 1600 |

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. | All three arguments are strings and the gateway is optional. |

| Command | Description | Values |
|------------------|---|---|
| NET+DGRP <group> | Sets the device group name for the projector. 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. | - |
| NET+ETH0? | Returns the projector IP address. (Read-only) | - |
| NET+GATE? | Returns the projector gateway address. (Read-only) | - |
| 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. | - |
| 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)
```

NTR—Network Routing

Enables or disables routing of Christie Protocol messages between the RS232, RS422, and Ethernet ports.



RS232-IN and RS232-OUT are always joined, regardless of the NTR setting.

Commands

| Command | Description | Values |
|-------------|--|--|
| NTR <value> | Enables or disables routing of Christie Protocol messages. | 0 = Separate (Default) 1 = RS232 and RS422 joined 2 = RS232 and Ethernet joined 3 = All joined (includes USB) |

Examples

Route messages between the RS232 ports to/from the RS422 port.

(NTR 1)

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 = 54 (fixed value) Major, Minor, Build = Software version | - |

Examples

Send a ping.

(PNG?)

PRO-Profile

Allows selection of a local profile on the projector.

Commands

| Command | Description | Values |
|---------|---|---|
| PRO?L | Returns the list of available local profiles: | - |
| 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 laser state. | 0 = Disables electronics override 1 = Enables electronics override |
| PWR? | Returns the current power state of the projector: 000 = Power Off 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+PRTA <value> | Sets the access level for the RS232-IN port. | 0 = No Access—Disables the port |
| RAL+PRTB <value> | Sets the access level for the RS232-OUT port. | 1 = Login Required—Sets read-only access until a separate login is performed |
| RAL+PRTC <value> | Sets the access level for the RS422 port. | 2 = Free Access—Executes commands at the operator level unless a separate login is performed (Default) |
| RAL+PUSB <value> | Sets the access level for the USB port. | |

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 |

Examples

Open the shutter.

(SHU 0)

Close the shutter.

(SHU 1)

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

(SHU?)

SNM–SNMP Configuration

Configures SNMP support for the projector.

Commands

| Command | Description | Values |
|---|--|---|
| SNM+TIP1 <ip address> SNM+TIP2 <ip address> SNM+TIP3 <ip address> | Sets up to three IP addresses for traps to be sent. | ip address = String value 0.0.0.0 disables notifications (Default) |
| SNM+READ <password> | Sets the password for SNMP notifications. | password = String value Default password = private |
| SNM+LAMP <0 1> | Enables or disables Lamp State SNMP traps. | 0 = Disables Lamp State SNMP traps 1 = Enables Lamp State SNMP traps |
| SNM+LIFE <0 1> | Enables or disables Lamp End-Of-Life SNMP traps. | 0 = Disables Lamp End-Of-Life SNMP traps 1 = Enables Lamp End-Of-Life SNMP traps |
| SNM+POWR <0 1> | Enables or disables Power On/Off SNMP traps. | 0 = Disables Power On/Off SNMP traps 1 = Enables Power On/Off SNMP traps |
| SNM+STAL <0 1> | Enables or disables Fan Stall SNMP traps. | 0 = Disables Fan Stall SNMP traps 1 = Enables Fan Stall SNMP traps |
| SNM+THRM <0 1> | Enables or disables Thermal warning/error SNMP traps | 0 = Disables Thermal warning/error SNMP traps 1 = Enables Thermal warning/error SNMP traps |

SOR–Screen Orientation

Changes the orientation of the displayed image.

Commands

| Command | Description | Values |
|-------------|---|--|
| SOR <value> | Changes the orientation of the displayed image. | 0 = Front Projection (Default) 1 = Rear Projection 2 = Front Projection Inverted 3 = Rear Projection Inverted |

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–Size and Position

Changes the aspect ratio of the display.

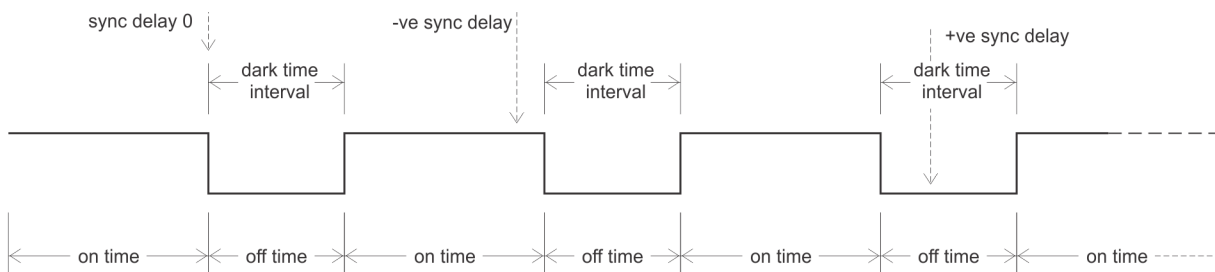
By default, the projector scales all video to the full screen with the exception of 16:9 content. 16:9 content is scaled to 3840x2160 with black pillar boxes on either side.

Commands

| Command | Description | Values |
|-------------|--|--|
| SZP <value> | Changes the aspect ratio of the display. | 0 = Allows the projector to determine when to scale video (Default) 1 = None 2 = Scales all content to the full screen |

TDD–3D Sync Delay

Configures where the sync pulse occurs in relation to the transition from on time to off time in the DMDs, in μ s.



Commands

| Command | Description | Values |
|-------------|---|--|
| TDD <value> | Configures where the sync pulse occurs. | 0 = Lines up the sync pulse with the transition (Default) Negative value = Configures the sync pulse to be slightly before the transition Positive value = Configures the sync pulse to be slightly after the transition |

TDM-3D Mode

Controls when input signals are processed as 3D or not.

Commands

| Command | Description | Values |
|-------------|---|---|
| TDM <1 2> | Controls when input signals are processed as 3D or not. | 1 = Automatically determines whether to enable 3D processing or not. When input signals are 60Hz or less, no frame doubling or tripling occurs unless a Dual Input 3D channel is selected. (Default) 2 = Configures the projector to enable 3D processing where possible. Frame doubling occurs when input signals are 60Hz. Frame tripling occurs when input signals are 48-50Hz. |

TDN-Invert 3D Input

Inverts the left and right eye frames.

Commands

| Command | Description | Values |
|-------------|------------------------------------|--|
| TDN <0 1> | Inverts left and right eye frames. | 0 = Leaves the left and right eye frames in their default order (Default) 1 = Reverses the order of the left and right eye frames |

TDO-3D Sync Out

Configures the 3D Sync OUT port for either an emitter or for another downstream projector.

Commands

| Command | Description | Values |
|-------------|----------------------------------|--|
| TDO <0 1> | Configures the 3D Sync OUT port. | 0 = Configures the 3D Sync OUT port to be fed directly to a 3D emitter, including any 3D sync delay (see TDD-3D Sync Delay on page 32) and/or sync inversion (see TDN-Invert 3D Input on page 33 (Default)) 1 = Configures the 3D Sync OUT port to be fed to another downstream projector, without including any 3D sync delay or inversion |

TDT-3D Test Pattern

Enables or disables the 3D test pattern.

Commands

| Command | Description | Values |
|-------------|--|---|
| TDT <0 1> | Enables or disables the 3D test pattern. | 0 = Disables the 3D test pattern 1 = Enables the 3D test pattern |

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

Examples

Set the time to 3pm.

(**TMD+TIME "15:00:00"**)

Set the date to September 17th, 2014.

(TMD+DATE "2014/09/17")

Get the local time.

(TMD+TIME?)

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.

Commands

| Command | Description | Values |
|------------------|---|--|
| WRP+SLCT? | Retrieves a list of available warp maps. | - |
| WRP+SLCT <value> | Changes the warp map to use on the projector. | 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.

Commands

| Command | Description | Values |
|----------------|--|---|
| ZOM <position> | Adjusts the lens zoom to the specified position. | Valid range changes based on calibration. |
| ZOM?m | Returns the current minimum and maximum values for the zoom position based on the last lens calibration performed. | - |

Examples

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 0000 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 0000 FYI01901 "Card x removed"</u>) | Triggered when a card is removed from slot X while the video electronics are on. |
| Date/Time | (<u>65535 0000 FYI00916</u> "Setting Date to 2014/06/20") | Generated when the date or time are changed, respectively. |
| | (<u>65535 0000 FYI00916</u> "Setting Time to 00:00:00") | |
| Factory defaults | (<u>65535 0000 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 0000 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: <ul style="list-style-type: none"> • 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 0000 FYI00000</u> " <u>(SST+LAMP?001)</u> Lamp Hours = 00:00 (h:m)") | Generated when a status item changes from an error or warning state to an OK state. |
| | (<u>65535 0000 ERR00000 "System Warning: (SST+LAMP?001)</u> Lamp Hours = N/A") | Generated when a status item changes from an OK or error state to a warning state. |
| | (<u>65535 0000 ERR00000 "System Error: (SST+VERS?003)</u> Image Processor HW Version = Detection Fault") | Generated when a status item changes from an OK or warning state to an error state. |

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