Mirage J Series

User Manual

020-100708-01

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This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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Canadian manufacturing facility is ISO 9001 and 14001 certified.

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For complete information about Christie limited warranty, please contact your Christie dealer. In addition to the other limitations that may be specified in Christie limited warranty, the warranty does not cover:

a. **Damage occurring during shipment, in either direction.**
b. **Projector lamps (See Christie separate lamp program policy).**
c. **Damage caused by use of a projector lamp beyond the recommended lamp life, or use of a lamp supplied by a supplier other than Christie.**
d. **Problems caused by combination of the product with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of the product with any non-Christie interface device.**
e. **Damage caused by misuse, improper power source, accident, fire, flood, lightening, earthquake or other natural disaster.**
f. **Damage caused by improper installation/alignment, or by product modification, if by other than a Christie authorized repair service provider.**
g. **For LCD projectors, the warranty period specified applies only where the LCD projector is in "normal use." "Normal use" means the LCD projector is not used more than 8 hours a day, 5 days a week. For any LCD projector where "normal use" is exceeded, warranty coverage under this warranty terminates after 6000 hours of operation.**
h. **Failure due to normal wear and tear.**

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Please see the Maintenance section for specific maintenance items as they relate to your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

1: Introduction

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A.1 Mirage J Series Menu Tree A-1

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1 Introduction

Every effort has been made to ensure the information in this document is accurate and reliable; however, due to constant research the information in this document is subject to change without notice.

1.1 Projector Overview

The Mirage J Series projectors provide a powerful combination of high resolution video/graphics, 3 chip 1080p HD, SXGA+, and WUXGA resolutions, high brightness and high contrast ratios to produce flawless, realistic three-dimensional images for simulation, virtual reality and other stereographic related applications.

This document applies to the following projector models:

Table 1.1 Mirage J Series Projectors

Model Name	Part Number
MIRAGE DS+8K-J	132-004127-XX
MIRAGE HD7K-J	132-005128-XX
MIRAGE WU7K-J	132-006129-XX
MIRAGE S+14K-J	132-010124-XX
MIRAGE HD14K-J	132-011125-XX
MIRAGE WU14K-J	132-012126-XX
MIRAGE S+18K-J	132-013127-XX
MIRAGE HD16K-J	132-014128-XX
MIRAGE S+22K-J	132-016120-XX
MIRAGE HD20K-J	132-017121-XX
MIRAGE WU20K-J	132-018122-XX

2 Operation

2.1 3D

The Mirage J Series projector is capable of displaying stereoscopic 3D video sources. The Mirage J Series relies on additional hardware; such as stereo emitters and glasses to complete the display system.

Images generated from a stereo 3D-video source consist of a series of images (*frames*) that alternate quickly between two slightly different view points, corresponding to your left and right eye. When these frames are displayed fast enough and viewed with special stereo glasses synchronized to the left/right (L/R) changes, the resulting image appears with the same depth and perspective that is sensed in the real world.

NOTE: *The type of special glasses can be active stereo or passive stereo glasses depending on the type of stereo controllers and screen used.*

2.1.1 Requirements

Stereo 3D applications require a stereo 3D-capable source, special hardware/software setups (described below), the *3D Settings* menu option to control the projector processing, synchronizing and displaying of your stereoscopic 3D source material.

Hardware:

- Christie 3D version of Mirage *J Series* projector.
- Christie 3D Stereo Sync Cable (required for 3D Mirage J Series models; ensures minimum frame delay). This General Purpose Input Output (GPIO) cable is standard with all Mirage J Series projectors. **NOTE:** *See Appendix B: GPIO.*
- A source, usually a computer with a stereo 3D graphics card capable of displaying progressive scan (alternating frames) of OpenGL quad buffered stereo 3D applications (suggested cards include ATI or NVIDIA), and running under *Windows, Linux, IRIX, HPUX, OSX* or *Solaris* operating systems.
- Emitter for controlling active shutter glasses.
- An appropriate qualified device that mounts in front of the lens of the projector that will process the light from the lens into a passive polarized light. Contact your Immersive dealer for more information.

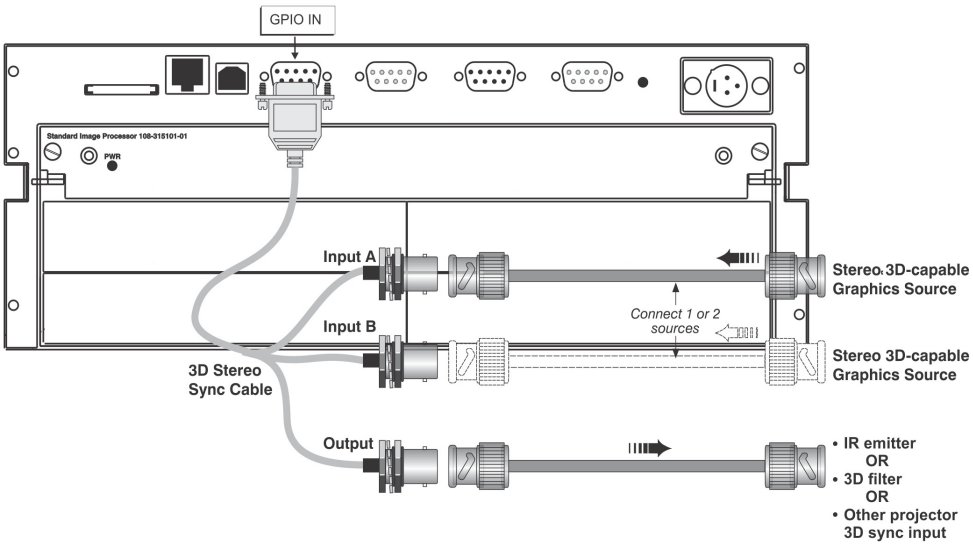
Software or content:

- Any 3D computer software that supports active or sequential 3D stereo on a supported computer/graphic card.
- A video stream from video source that has been prepared to be sequential content. Supports stereo signals prepared on either a compatible Dual and Single link HDSDI format.
- Compatible passive dual channel sources, providing each signal type is frame locked and the input connections are identical.

CONNECTING THE 3D STEREO SYNC CABLE

This GPIO cable provides the means for synchronizing the various components in your 3D system. Your source, projector display output, and emitters or 3D passive filter system can then operate together with precision to minimize cross-talk and color artifacts. Connect as shown below.

NOTE: *For Mirage J Series models, inputs A and B are not required, but recommended to ensure that stereo is configured correctly, especially for multiple projector setups.*



Connecting Two Stereo 3D Sync Inputs (Recommended for multiple sources). Connect your video card's stereo 3D sync cable to either Input A or either Input B on the 3D Stereo Sync Cable. These inputs are provided to allow you to connect two different Stereo 3D sources and conveniently switch the display back-and-forth between them.

Connecting One Stereo 3D Sync Output Connect the 3D Stereo Sync Cable output to your stereo 3D sync emitter or 3D passive filter system, PZE device. The L/R switching of the device can then be synchronized according to the controlling signal of choice—either the source input signal or the internally generated signal—as set in the 3D Settings menu.

2.1.2 Active and Passive Stereo 3D Configurations

Typical hardware configurations for active and passive Stereo 3D systems are shown in *Figure 1 - Mirage J Series - Typical Stereo 3D Configuration: With Active Glasses* and *Figure 2 - Mirage J Series - Typical Stereo 3D Configuration: With Passive Glasses*.

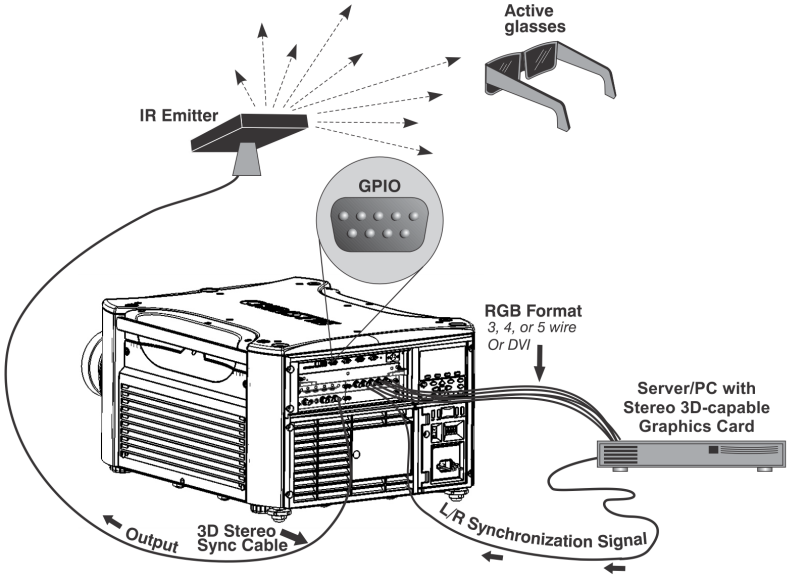


Figure 1 - Mirage J Series - Typical Stereo 3D Configuration: With Active Glasses

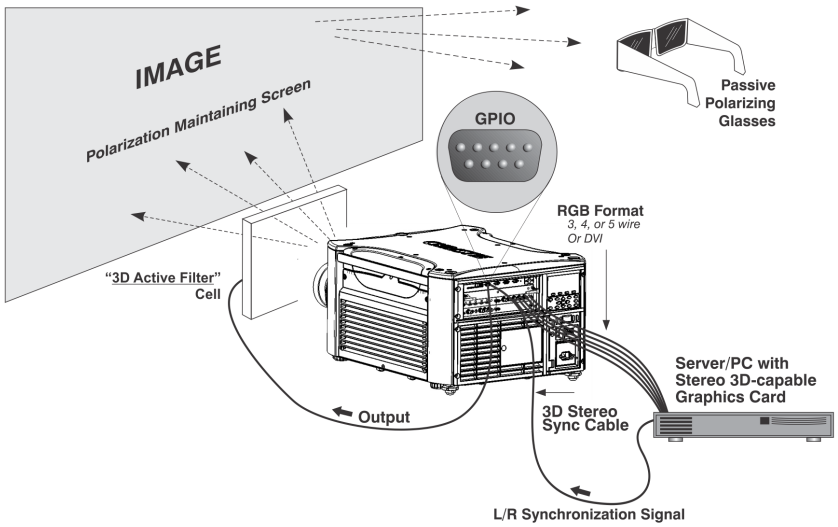


Figure 2 - Mirage J Series - Typical Stereo 3D Configuration: With Passive Glasses

Appropriate Stereo 3D Source: Use stereo 3D application software with your 3D video source (usually a workstation or PC). The source must provide a separate stereo 3D synchronization signal that precisely controls when the left/right fields are visible through the glasses of the viewer. This separate signal is usually provided using a VESA 3 pin stereo port.

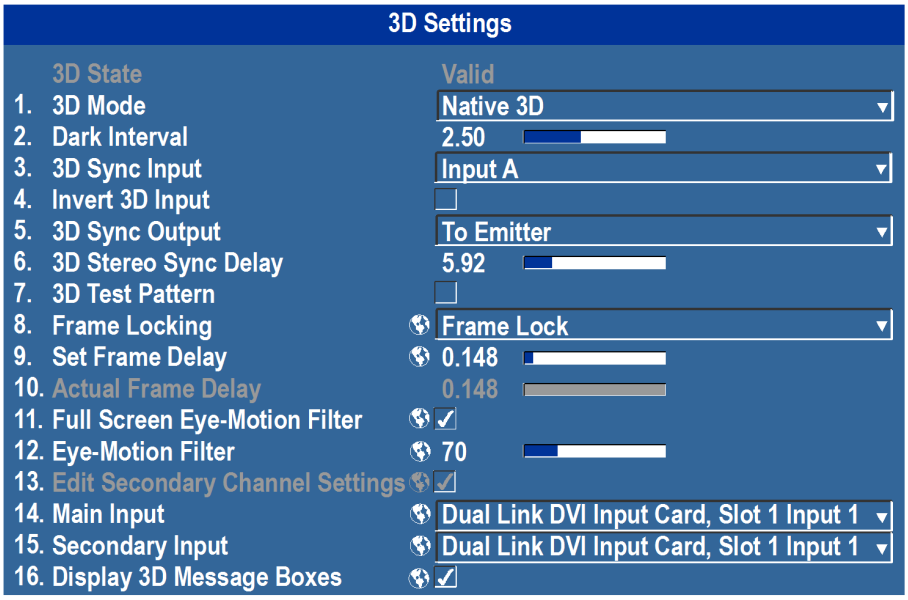
IR Emitter/3D Passive Filter System: In response to an incoming sync signal, the emitter emits L/R infrared signals to a receiver in active 3D shutter glasses, causing the L/R shutters to alternately open and close for active stereo 3D applications. Likewise, a 3D passive filter system placed in front of the lens responds to an incoming sync signal and alternately polarizes the L/R frames viewed with passive glasses for active stereo 3D applications. Connecting one of the 3D Stereo Sync Cable outputs to an emitter/3D passive filter system allows you to synchronize your stereo 3D display with the glasses.

Glasses (Active/Passive): Active glasses differ in speed and performance. Consult the documentation for your glasses and keep their specifications in mind when configuring your source signal. The input signal must be optimized for the available shutter speed to prevent obvious "ghosting" of image content (known as cross-talk in stereo 3D applications) and other more subtle color artifacts. Such problems indicate that the eyes are detecting portions of the opposing frame due to an "out-of-sync" system, and can occur in either active or passive stereo 3D configurations. Adjust the Dark Interval setting to reduce ghosting.

In the 3D Settings menu, the correct "3D Stereo Sync Delay" setting should help to synchronize glasses with the displayed images. **NOTE:** *In a passive system, where glasses do not have shutters and instead depend on the speed and accuracy of the 3D passive filter system, the signal must be synchronized to the projector via the 3D Stereo Sync Cable.*

4.2 3D SETTINGS

Use the options in the 3D Settings menu to make the timing adjustments necessary for realistic simulation and 3D images.



3D State: Informs you what state the projector is in: Off, Missing Secondary Signal, Not Frame Locked, Secondary Frequency Mismatch, High Bandwidth Not Supported, Stereo Sync Not Detected, Stereo Sync Invalid, and Invalid Frequency. **NOTE:** *This is read only.*

3D Mode: Select the mode of your 3D operation.

Off: 3D operation is disabled.

Auto 3D: Attempts to automatically determine which 3D mode to use based on auxiliary video data, e.g. HDMI info frame.

Native 3D: All content is shown at a native frame rate of 96 - 120 Hz input and output.

Frame Doubled 3D: 3D Content from a single 48-60Hz signal (24/30Hz per eye) is displayed twice to provide a 3D content to be viewed at 96-120Hz.

Dual Input 3D: Content from two independent 48-60Hz 'passive' frame locked sources are interleaved into a native 96-120Hz native frame rate. This requires and optional input module and both signals must be from the same signal type.

Side-by-Side 3D: Content is transmitted with each eye beside each other in a single frame, and is extracted and scaled appropriately to show in an alternate-frame sequence. Typically used for broadcast 3D-TV.

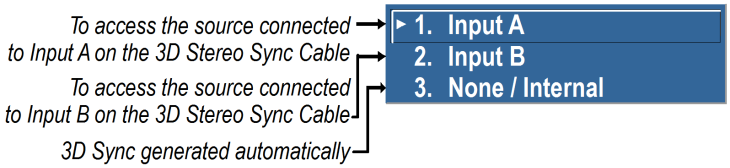
Top-and-Bottom 3D: Content is transmitted with each eye above one another in a single frame at half resolution, and is extracted and scaled to show in an alternate-frame sequence.

Frame Packed 3D: Content is transmitted with each eye at full resolution in a double-sized frame, and is extracted to show in an alternate-frame sequence. Typically used for Blu-ray 3D movies and 3D video gaming.

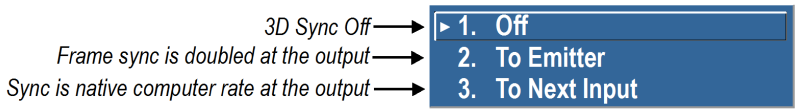
Triple-Flash 3D: 3D Content from a single 48Hz signal (24Hz per eye) is displayed three times to provide you a 3D image to be viewed at 144Hz.

Dark Interval: Artificially increases the amount of dark time between displayed frames for stereoscopic 3D images. Higher settings provide more time for shutters in 3D glasses to open and close, ensuring that each eye sees the full display intended for it. Symptoms of cross talk or color artifacts can indicate the need for adjustment. The Dark Interval range of adjustment depends on the vertical frequency of your source-the higher the frequency, the smaller the range. Default setting is 2.3ms.

3D Sync Input: The 3D sync signal is generated by the 3D source to insure left/right eye content is synchronized to the projector and you. The projector has the ability to physically connect to two different sources. Ensure that the correct 3D sync input is selected (either Input A or Input B) with each 3D signal source. If none/internal is selected the projector will generate the sync internally and content will be displayed; however, there is a 50% chance that the content will be displayed with the left/right eyes swapped (from the remote, press FUNC 6-9 to swap the eyes). **NOTE:** *This function is not used in Interleaved 3D mode. Each eye receives a selected input and no 3D sync input is required.*



3D Sync Output: This option defines whether the 3D Sync is output and controls how it is processed. It is only valid when an optional cable is used to connect stereo 3D signals to the projector via the GPIO port. When there is no 3D signal, Sync Output should be '**Off**'. Typically only the last projector in the 3D Stereo cable chain is connected to the emitter and should specify '**To Emitter**'. All other projectors should select '**To Next Input**' if other projectors are used in the chain.



3D Stereo Sync Delay: Adjust the output 3D emitter delay (in milliseconds) to match the active glasses to the L/R frames of the projector. Proper adjustment of this delay will eliminate cross talk and odd colors caused by timing differences between the glasses and the projected image. Your specified delay is added after sync locking.

3D Test Pattern: Enables a 3D test pattern for diagnostics. The scrolling diagonal lines indicate how well left and right are synchronized. If ghosting is occurring the input may have to be switched or inverted. Adjustments to the emitter delay can also help correct the synchronization. To verify that your 3D is setup correctly, a small set of "L"s will be visible when you close your right eye and a small set of "R"s will be visible when you close your left eye.

Frame Locking: Enable or disable Frame Lock. When set to Frame Lock, if possible output image frames are locked to the input. When Locked, the output is always locked to the primary input and never the secondary image, when using Dual input 3D. Free Run sets the output to close to 60Hz for all sources. This control must be set to locked if a 3D-Stereo signal is used.

Set Frame Delay: Delays the output signal timing relative to the input signal timing by a fraction of a frame, and up to several frames. The minimum latency can vary based on the amount of scaling applied to the image. When using keystone or warping, an additional latency is required, depending on the amount of warp. The control is only available when the input signal is frame locked. In free run mode, or in cases where the signal cannot be frame locked, the minimum latency defined by the scaling and keystone/warp is applied to the signal.

Actual Frame Delay: Displays the actual frame delay reading.

Full Screen Eye-Motion Filter: Check this control to apply the Eye-Motion Filter to the entire screen, rather than applying just to the edge blending regions. Helps with posterization effects, sometimes seen in color ramps when viewing stereoscopic images.

Eye-Motion Filter: Adjust this filter to reduce saccadic eye-motion artifacts, sometimes noticeable in edge blending regions. Too much filtering may result in loss of detail. For best results, adjust this setting while positioned at the nominal screen-viewing distance.

Edit Secondary Channel Settings: When using Dual Input 3D, this allows you the option to independently control primary and secondary channel settings, or to use the same setting for both links. By default, this control is unchecked, meaning any settings applied to the primary input will also be applied to the secondary input. In this case, the secondary channel settings cannot be set. When checked, the secondary channel settings become editable.

Main Input: Select an input from the drop-down list.

Secondary Input: Select an input to be used as secondary input in a Dual Input 3D setup.

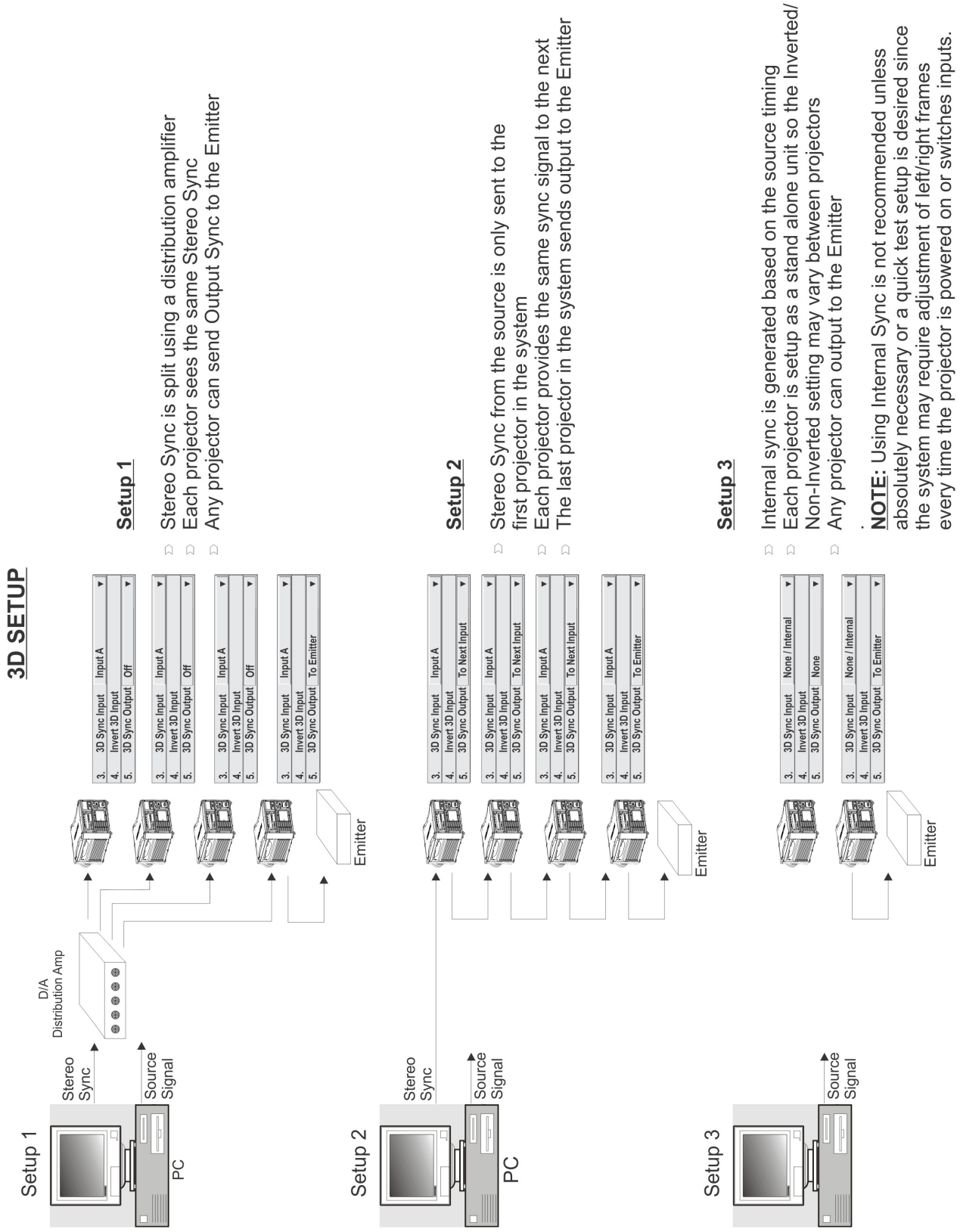
Display 3D Message Boxes: Enable/Disable message boxes that are triggered by 3D setup. **NOTE:** *No message box is shown in "Off" and "Valid" state.*

2.1.3 Example of 3D Multiple Display Setup

The following instructions is an example of a multiple display setup or refer to Figure 2-3 Example of 3D Multiple Display Setup.

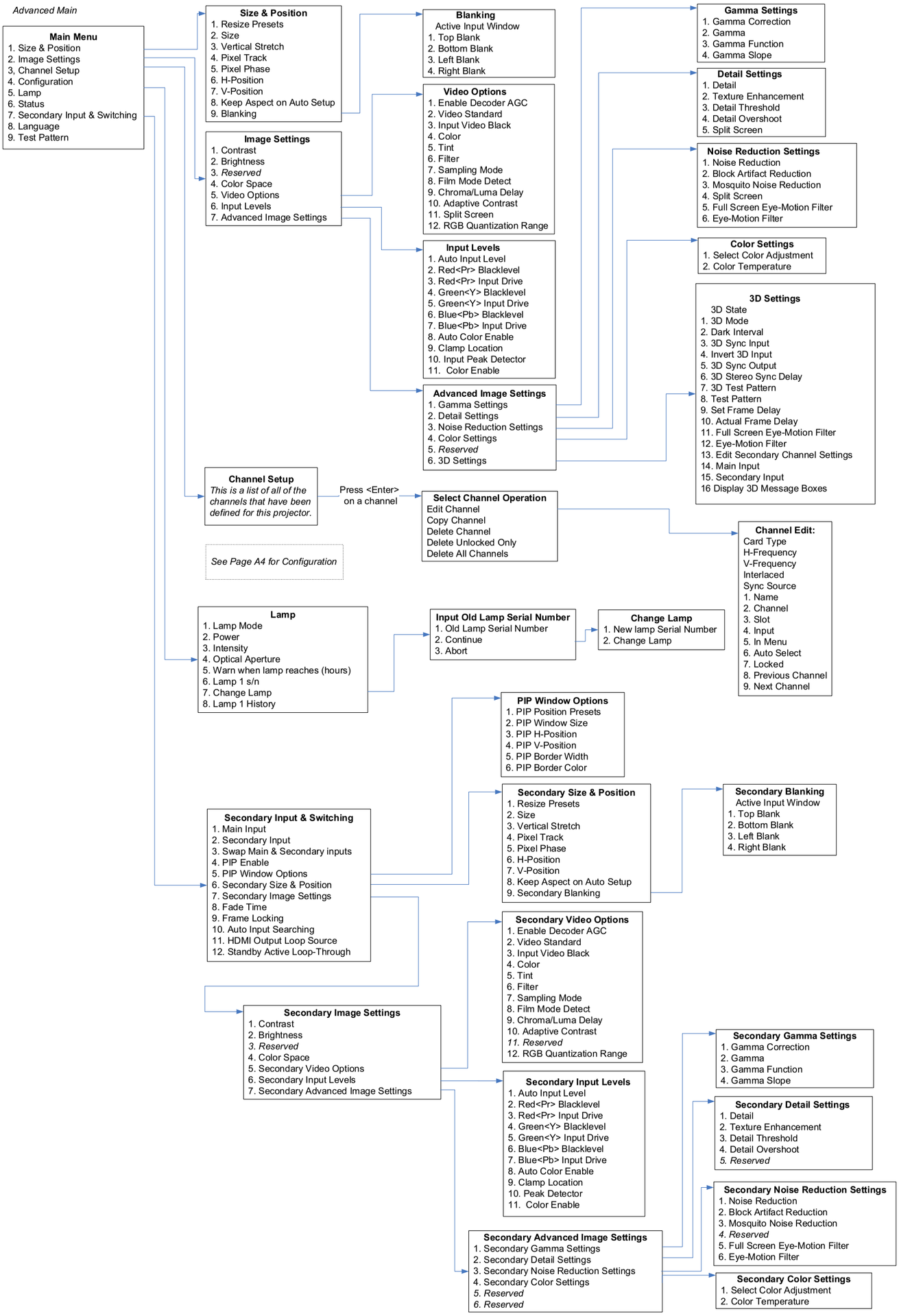
1. Setup the warp and blends for the projector.
2. If necessary, shift or scale your image to fit the display.
3. Set all projectors to the largest minimum Frame Delay value that the worst case projector in the array can achieve.
4. Enable 3D mode on all projectors. Using the remote >**Main Menu**>**Image Settings**>**Advanced Image Settings**>**3D Settings**
5. Set all projectors 3D Sync Output to "**Next Projector**" with the exception of the last projector; select "**To Emitter**."
6. Connect the PC emitter sync to either **Input A** (or B) on the 3D dongle.
7. Connect the output from the 3D dongle in the first projector to **Input A** (or B) on the next projector in the array.
8. Repeat the same procedure to all projectors except the last projector in the array. Route the Sync output from the 3D dongle to the emitter. **NOTE:** *For the last projector, route the sync input.*
9. If your emitter has a reverse setting ensure it is set to the Off position.
10. Set all projectors to **3D Sync Input A** (or B) depending on your selection in Step 6 & 7.
11. Apply the 3D test pattern to all projectors.
12. Put on your 3D glasses.
13. When 3D is setup correctly, a small set of the letter L is visble by closing your right eye and a small set of the letter R is visible when closing your left eye.
14. If necessary, adjust the dark interval settings until the test pattern sees the least amount of ghosting for each projector.
15. Adjust the 3D Sync Delay on the last projector in your array to match the optimal sampling point for the glasses being used. **NOTE:** *The default auto setup value is typically good for all glasses.*
16. Turn off the 3D test pattern on each projector. Your 3D content should look optimal.

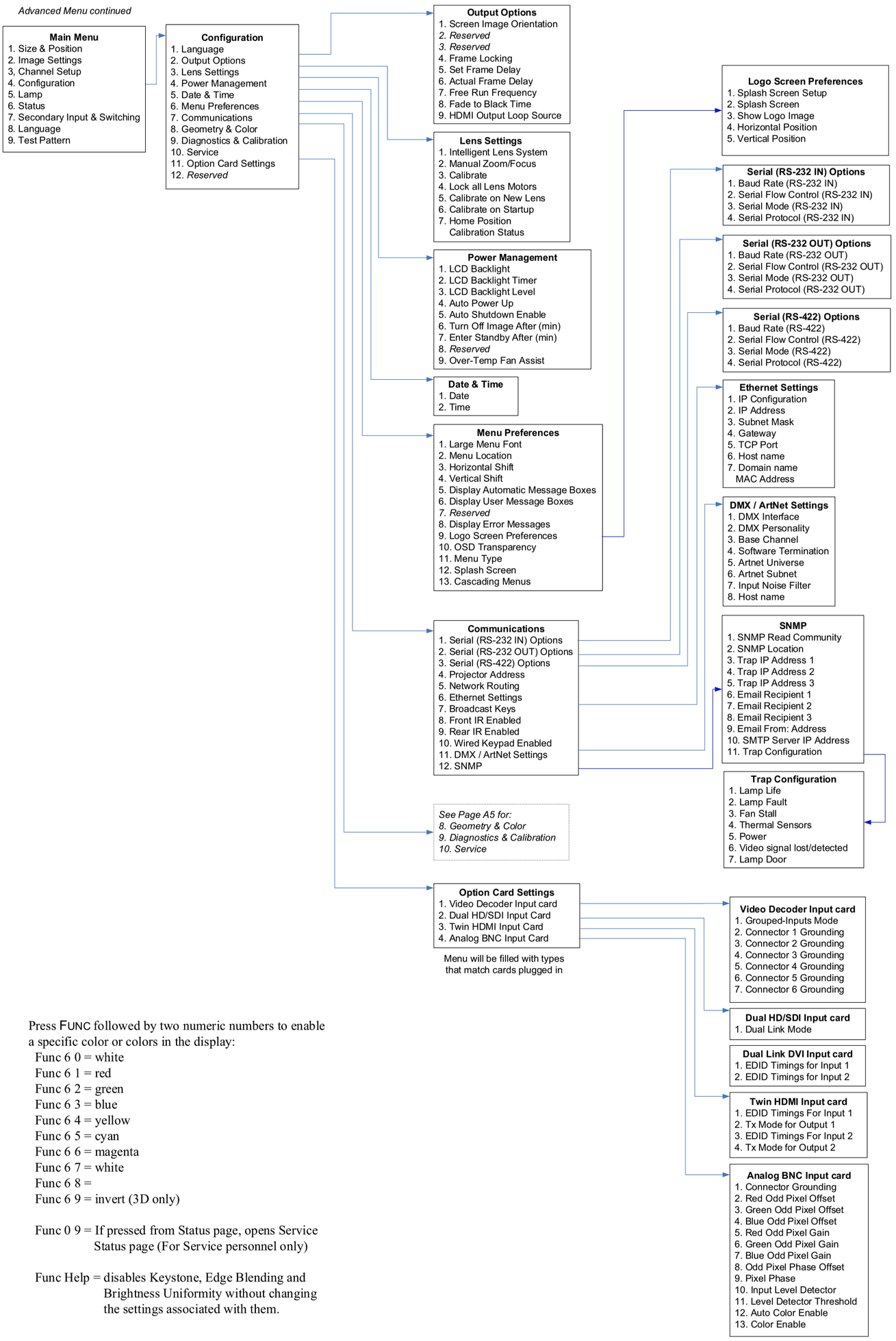
FIGURE 2-3 EXAMPLE OF 3D MULTIPLE DISPLAY SETUP



Appendix A: Menu Tree

A.1 Mirage J Series Menu Tree


Advanced Main
Main Menu
1. Size & Position
2. Image Settings
3, Channel Setup
4. Configuration
5. Lamp
6. Status
7. Secondary Input & Switching
8. Language
9. Test Pattern
Size & Position
1. Resize Presets
2. Size
3. Vertical Stretch
4. Pixel Track
5. Pixel Phase
6. H-Position
7. V-Position
8. Keep Aspect on Auto Setup
9. Blanking
Image Settings
1. Contrast
2. Brightness
3. Reserved
4. Color Space
5. Video Options
6. Input Levels
7. Advanced Image Settings
Blanking
Active Input Window
1. Top Blank
2. Bottom Blank
3. Left Blank
4. Right Blank
Video Options
1. Enable Decoder AGC
2. Video Standard
3. Input Video Black
4. Color
5. Tint
6. Filter
7. Sampling Mode
8. Film Mode Detect
9. Chroma/Luma Delay
10. Adaptive Contrast
11. Split Screen
12. RGB Quantization Range
Input Levels
1. Auto Input Level
2. Red<Pr> Blacklevel
3. Red<Pr> Input Drive
4. Green<Y> Blacklevel
5. Green<Y> Input Drive
6. Blue<Pb> Blacklevel
7. Blue<Pb> Input Drive
8. Auto Color Enable
9. Clamp Location
10. Input Peak Detector
11. Color Enable
Advanced Image Settings
1. Gamma Settings
2. Detail Settings
3. Noise Reduction Settings
4. Color Settings
5. Reserved
6. 3D Settings
Gamma Settings
1. Gamma Correction
2. Gamma
3. Gamma Function
4. Gamma Slope
Detail Settings
1. Detail
2. Texture Enhancement
3. Detail Threshold
4. Detail Overshoot
5. Split Screen
Noise Reduction Settings
1. Noise Reduction
2. Block Artifact Reduction
3. Mosquito Noise Reduction
4. Split Screen
5. Full Screen Eye-Motion Filter
6. Eye-Motion Filter
Color Settings
1. Select Color Adjustment
2. Color Temperature
3D Settings
3D State
1. 3D Mode
2. Dark Interval
3. 3D Sync Input
4. Invert 3D Input
5. 3D Sync Output
6. 3D Stereo Sync Delay
7. 3D Test Pattern
8. Test Pattern
9. Set Frame Delay
10. Actual Frame Delay
11. Full Screen Eye-Motion Filter
12. Eye-Motion Filter
13. Edit Secondary Channel Settings
14. Main Input
15. Secondary Input
16 Display 3D Message Boxes
Channel Setup
This is a list of all of the channels that have been defined for this projector.
Press <Enter> on a channel
Select Channel Operation
Edit Channel
Copy Channel
Delete Channel
Delete Unlocked Only
Delete All Channels
Channel Edit:
Card Type
H-Frequency
V-Frequency
Interlaced
Sync Source
1. Name
2. Channel
3. Slot
4. Input
5. In Menu
6. Auto Select
7. Locked
8. Previous Channel
9. Next Channel
See Page A4 for Configuration
Lamp
1. Lamp Mode
2. Power
3. Intensity
4. Optical Aperture
5. Warn when lamp reaches (hours)
6. Lamp 1 s/n
7. Change Lamp
8. Lamp 1 History
Input Old Lamp Serial Number
1. Old Lamp Serial Number
2. Continue
3. Abort
Change Lamp
1. New lamp Serial Number
2. Change Lamp
PIP Window Options
1. PIP Position Presets
2. PIP Window Size
3. PIP H-Position
4. PIP V-Position
5. PIP Border Width
6. PIP Border Color
Secondary Input & Switching
1. Main Input
2. Secondary Input
3. Swap Main & Secondary inputs
4. PIP Enable
5. PIP Window Options
6. Secondary Size & Position
7. Secondary Image Settings
8. Fade Time
9. Frame Locking
10. Auto Input Searching
11. HDMI Output Loop Source
12. Standby Active Loop-Through
Secondary Size & Position
1. Resize Presets
2. Size
3. Vertical Stretch
4. Pixel Track
5. Pixel Phase
6. H-Position
7. V-Position
8. Keep Aspect on Auto Setup
9. Secondary Blanking
Secondary Blanking
Active Input Window
1. Top Blank
2. Bottom Blank
3. Left Blank
4. Right Blank
Secondary Video Options
1. Enable Decoder AGC
2. Video Standard
3. Input Video Black
4. Color
5. Tint
6. Filter
7. Sampling Mode
8. Film Mode Detect
9. Chroma/Luma Delay
10. Adaptive Contrast
11. Reserved
12. RGB Quantization Range
Secondary Image Settings
1. Contrast
2. Brightness
3. Reserved
4. Color Space
5. Secondary Video Options
6. Secondary Input Levels
7. Secondary Advanced Image Settings
Secondary Input Levels
1. Auto Input Level
2. Red<Pr> Blacklevel
3. Red<Pr> Input Drive
4. Green<Y> Blacklevel
5. Green<Y> Input Drive
6. Blue<Pb> Blacklevel
7. Blue<Pb> Input Drive
8. Auto Color Enable
9. Clamp Location
10. Peak Detector
11. Color Enable
Secondary Advanced Image Settings
1. Secondary Gamma Settings
2. Secondary Detail Settings
3. Secondary Noise Reduction Settings
4. Secondary Color Settings
5. Reserved
6. Reserved
Secondary Gamma Settings
1. Gamma Correction
2. Gamma
3. Gamma Function
4. Gamma Slope
Secondary Detail Settings
1. Detail
2. Texture Enhancement
3. Detail Threshold
4. Detail Overshoot
5. Reserved
Secondary Noise Reduction Settings
1. Noise Reduction
2. Block Artifact Reduction
3. Mosquito Noise Reduction
4. Reserved
5. Full Screen Eye-Motion Filter
6. Eye-Motion Filter
Secondary Color Settings
1. Select Color Adjustment
2. Color Temperature

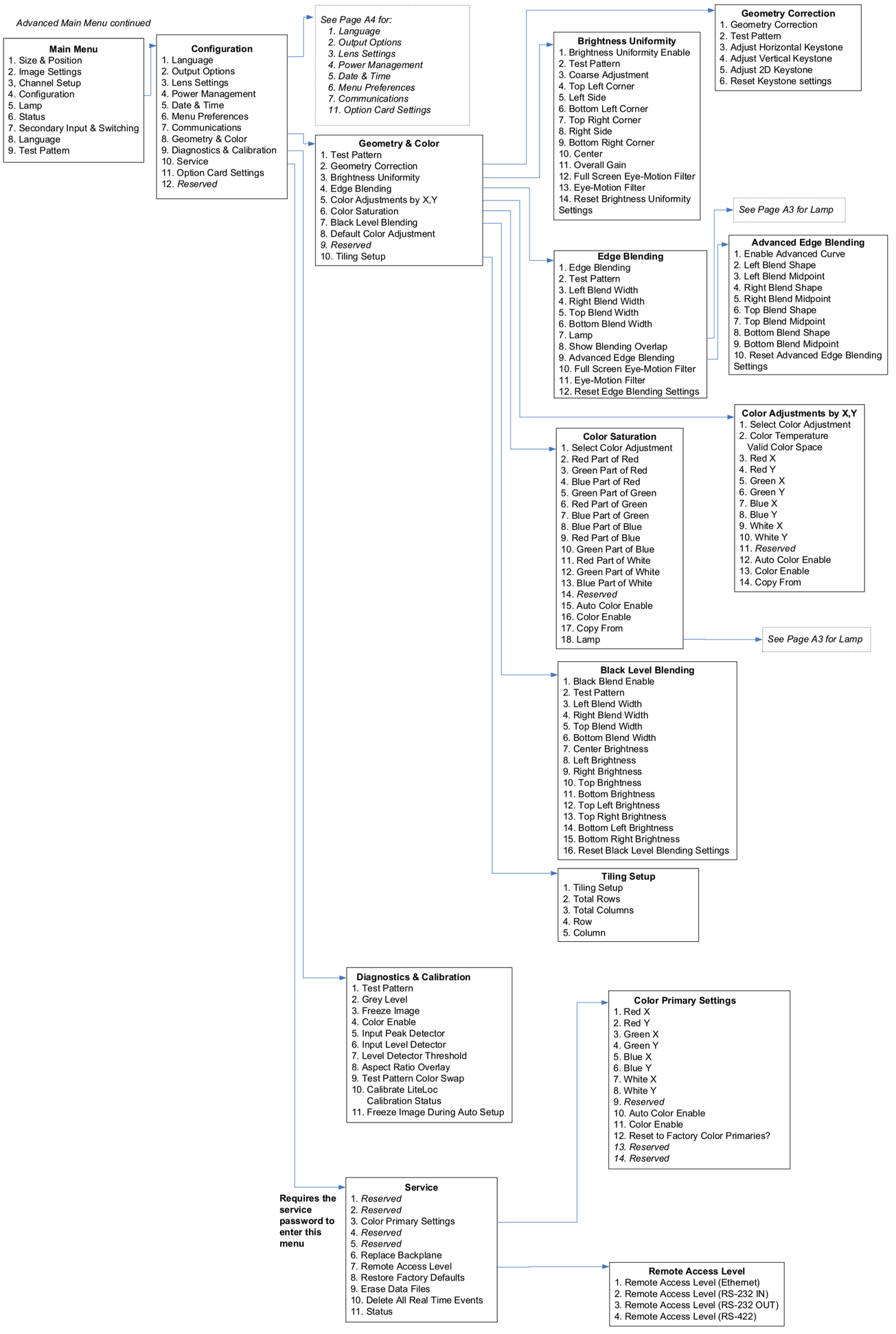


Press FUNC followed by two numeric numbers to enable a specific color or colors in the display:

Func 6 0 = white
Func 6 1 = red
Func 6 2 = green
Func 6 3 = blue
Func 6 4 = yellow
Func 6 5 = cyan
Func 6 6 = magenta
Func 6 7 = white
Func 6 8 =
Func 6 9 = invert (3D only)

Func 0 9 = If pressed from Status page, opens Service Status page (For Service personnel only)

Func Help = disables Keystone, Edge Blending and Brightness Uniformity without changing the settings associated with them.


Advanced Main Menu continued
Main Menu
1. Size & Position
2. Image Settings
3, Channel Setup
4. Configuration
5. Lamp
6. Status
7. Secondary Input & Switching
8. Language
9. Test Pattern
Configuration
1. Language
2. Output Options
3. Lens Settings
4. Power Management
5. Date & Time
6. Menu Preferences
7. Communications
8. Geometry & Color
9. Diagnostics & Calibration
10. Service
11. Option Card Settings
12. Reserved
See Page A4 for:
1. Language
2. Output Options
3. Lens Settings
4. Power Management
5. Date & Time
6. Menu Preferences
7. Communications
11. Option Card Settings
Geometry & Color
1. Test Pattern
2. Geometry Correction
3. Brightness Uniformity
4. Edge Blending
5. Color Adjustments by X,Y
6. Color Saturation
7. Black Level Blending
8. Default Color Adjustment
9. Reserved
10. Tiling Setup
Geometry Correction
1. Geometry Correction
2. Test Pattern
3. Adjust Horizontal Keystone
4. Adjust Vertical Keystone
5. Adjust 2D Keystone
6. Reset Keystone settings
Brightness Uniformity
1. Brightness Uniformity Enable
2. Test Pattern
3. Coarse Adjustment
4. Top Left Corner
5. Left Side
6. Bottom Left Corner
7. Top Right Corner
8. Right Side
9. Bottom Right Corner
10. Center
11. Overall Gain
12. Full Screen Eye-Motion Filter
13. Eye-Motion Filter
14. Reset Brightness Uniformity Settings
Edge Blending
1. Edge Blending
2. Test Pattern
3. Left Blend Width
4. Right Blend Width
5. Top Blend Width
6. Bottom Blend Width
7. Lamp
8. Show Blending Overlap
9. Advanced Edge Blending
10. Full Screen Eye-Motion Filter
11. Eye-Motion Filter
12. Reset Edge Blending Settings
See Page A3 for Lamp
Advanced Edge Blending
1. Enable Advanced Curve
2. Left Blend Shape
3. Left Blend Midpoint
4. Right Blend Shape
5. Right Blend Midpoint
6. Top Blend Shape
7. Top Blend Midpoint
8. Bottom Blend Shape
9. Bottom Blend Midpoint
10. Reset Advanced Edge Blending Settings
Color Adjustments by X,Y
1. Select Color Adjustment
2. Color Temperature
Valid Color Space
3. Red X
4. Red Y
5. Green X
6. Green Y
7. Blue X
8. Blue Y
9. White X
10. White Y
11. Reserved
12. Auto Color Enable
13. Color Enable
14. Copy From
Color Saturation
1. Select Color Adjustment
2. Red Part of Red
3. Green Part of Red
4. Blue Part of Red
5. Green Part of Green
6. Red Part of Green
7. Blue Part of Green
8. Blue Part of Blue
9. Red Part of Blue
10. Green Part of Blue
11. Red Part of White
12. Green Part of White
13. Blue Part of White
14. Reserved
15. Auto Color Enable
16. Color Enable
17. Copy From
18. Lamp
See Page A3 for Lamp
Black Level Blending
1. Black Blend Enable
2. Test Pattern
3. Left Blend Width
4. Right Blend Width
5. Top Blend Width
6. Bottom Blend Width
7. Center Brightness
8. Left Brightness
9. Right Brightness
10. Top Brightness
11. Bottom Brightness
12. Top Left Brightness
13. Top Right Brightness
14. Bottom Left Brightness
15. Bottom Right Brightness
16. Reset Black Level Blending Settings
Tiling Setup
1. Tiling Setup
2. Total Rows
3. Total Columns
4. Row
5. Column
Diagnostics & Calibration
1. Test Pattern
2. Grey Level
3. Freeze Image
4. Color Enable
5. Input Peak Detector
6. Input Level Detector
7. Level Detector Threshold
8. Aspect Ratio Overlay
9. Test Pattern Color Swap
10. Calibrate LiteLoc
Calibration Status
11. Freeze Image During Auto Setup
Color Primary Settings
1. Red X
2. Red Y
3. Green X
4. Green Y
5. Blue X
6. Blue Y
7. White X
8. White Y
9. Reserved
10. Auto Color Enable
11. Color Enable
12. Reset to Factory Color Primaries?
13. Reserved
14. Reserved
Requires the service password to enter this menu
Service
1. Reserved
2. Reserved
3. Color Primary Settings
4. Reserved
5. Reserved
6. Replace Backplane
7. Remote Access Level
8. Restore Factory Defaults
9. Erase Data Files
10. Delete All Real Time Events
11. Status
Remote Access Level
1. Remote Access Level (Ethernet)
2. Remote Access Level (RS-232 IN)
3. Remote Access Level (RS-232 OUT)
4. Remote Access Level (RS-422)

Appendix B: GPIO

This section explains how to use a GPIO link from the projector to external equipment, such as devices for 3D synchronizing.

B.1 GPIO Port

The GPIO connector located on the input panel provides a flexible method of interfacing a wide range of external I/O devices to the projector. There are 7 GPIO pins available on the 9pin D-Sub GPIO connector, which are configurable via RS-232 commands.The other two pins are reserved for ground and power - see table below for pin identification.

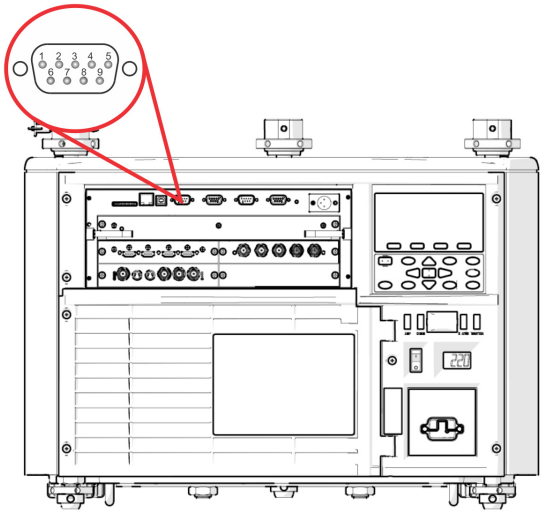


Table B.1 GPIO Pin

GPIO PINS	
PIN #	**SIGNAL**
Pin 1	**+ 12V (200mA)**
Pin 2	**GPIO 2**
Pin 3	**GPIO 4**
Pin 4	**GPIO 6**
Pin 5	**Ground**
Pin 6	**GPIO 1**
Pin 7	**GPIO 3**
Pin 8	**GPIO 5**
Pin 9	**GPIO 7**

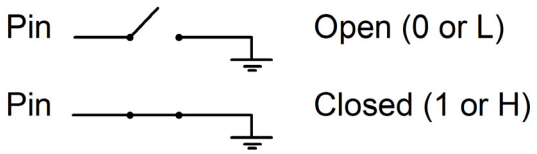
The serial cable required for connecting the external device to the GPIO connector of the projector, must be compatible with the external device.

Configuring the GPIO

The GPIO connector can be configured to automate any number of events using the serial command code **GIO**. Each Pin is defined as either an ***input*** or ***output*** depending on the desired outcome. Configure the pin as an input if you want the projector to respond to something the device does and as an output if you want the external device to respond to an action taken by the projector. For example, configure the pin as an output if you want the lighting in a room to automatically dim when the projector is turned on.

By using the GIO command, you can also set the state of each output pin as ***high*** or ***low***. By default, the state of each pin is ***high***. The voltage applied to pins in the high state is +3.3V.

A low state (or value of 0) will be read on an input pin if the circuit attached to the pin is open. A high state (or value of 1) will be read on an input pin if the circuit attached to the pin is shorted to ground. This corresponds to a switch closing event.



Example 1. Turn room lighting on when the projector is turned off. (*Assumes a control/automation unit is configured to turn the lights on when pin 2 of its input goes high.*)

(GIO+CNFG "OOOIIII")	*Set pin #2, 3 & 4 configuration to output and pin 6, 7, 8 & 9 to input*
(GIO+STAT "HLXXXXX")	*Set pin #2 to high, pin 3 to low and the state of all other pins unchanged*
Query Command	
(GIO+STAT)	*Request the state of all pins*
(GIO+STAT "HLLHLLH")	*Reply of pin states - H means pin is high, L means pin is low*
(GIO+CNFG)	*Request the configuration of all pins*
(GIO+CNFG "IIIOOOO")	*Reply of pin configurations - pins 2, 3 & 4 are Inputs, pins 6, 7, 8 & 9 are Outputs*

NOTE: *The strings in the commands refer to pins 2, 3, 4, 6, 7, 8, 9 in order from left to right.*

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