The top half of the page features a complex, abstract background of overlapping, semi-transparent blue triangles and polygons in various shades of blue, creating a dynamic, crystalline effect. This pattern tapers off towards the bottom left, meeting a white background.

User Guide  
020-101948-02

# M Series

**CHRISTIE®**

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- f. Problems or damage caused by misuse, improper power source, accident, fire, flood, lightning, earthquake or other natural disaster.
- g. Problems or damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized repair service provider.
- h. Problems or damage caused by use of a product on a motion platform or other movable device where such product has not been designed, modified or approved by Christie for such use.
- i. Problems or damage caused by use of a projector in the presence of an oil-based fog machine or laser-based lighting that is unrelated to the projector.
- j. For LCD projectors, the warranty period specified in the warranty applies only where the LCD projector is in "normal use" which means the LCD projector is not used more than 8 hours a day, 5 days a week.
- k. Except where the product is designed for outdoor use, problems or damage caused by use of the product outdoors unless such product is protected from precipitation or other adverse weather or environmental conditions and the ambient temperature is within the recommended ambient temperature set forth in the specifications for such product.
- l. Defects caused by normal wear and tear or otherwise due to normal aging of a product.

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The warranty does not obligate Christie to provide any on site warranty service at the product site location.

### PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.


### REGULATORY

The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

CAN ICES-3 (A) / NMB-3 (A)

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The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol  means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

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# Introduction

This manual is intended for professionally trained operators of Christie high-brightness projection systems.

Only Christie qualified technicians who are knowledgeable about the hazards associated with high-voltage, ultraviolet exposure, and the high temperatures generated by the projector lamps are authorized to assemble, install, and service the projector.

For complete M Series product documentation and technical support, go to [www.christiedigital.com](http://www.christiedigital.com).

## Projector overview

The M Series is a family of high resolution video/graphics three chip 1080p HD, SXGA+, and WUXGA projectors. These projectors are based on next generation DLP™ technology provided by Texas Instruments.

The projector accepts data/graphics and video input signals for projection onto front or rear screens. Light is generated by dual mercury lamps, then modulated by three Digital Micro-mirror Device (DMD) panels that provide digitized red, green or blue color information. Light from the ON pixels of each panel is reflected, converged, and then projected to the screen through a single front lens, where all pixels are perfectly superimposed as a sharp full-color image.

The projector is configured through a on-screen display (OSD) menu system displayed on the image, controlled by an IR remote, wired remote, or through the built-in keypad. The LCD screen and built-in keypad allow some functions to be controlled without the need of the OSD, and provide an accessible interface to view error reporting. The functions on the OSD can also be controlled using the Christie serial protocol, through a serial or Ethernet connection to the projector. The web interface provides access to the menu system as a virtual OSD and to features that maintain the software and settings.

## Key features

Understand the important features of the projector.

- Up to 14,000 lumens
- HD (1080p), SXGA+, or WUXGA resolution
- Dual Mercury lamp illumination with 350W and 450W options
- Contrast aperture providing up to 10,000:1 contrast ratio (available on 350W models)
- Ultra-compact design and weighs less than 55lbs
- 10-bit image processor electronics with modular design
- Fully sealed optical system
- Active fan control for minimum noise level
- Selectable, motorized Yellow Notch Filter for expanded color gamut
- User interchangeable projection lenses with no-tool mounting
- Picture-in-picture (PIP)

- LiteLOC for constant brightness maintenance
- Intelligent Lens System (ILS)
- Motorized lens mount for all models
- Auto-setup feature
- Integrated ChristieNET
- Networking ability through RS232 and RS422 connectors
- Status LED display on built-in keypad for easy projector status monitoring
- Control with remote keypad, wired remote, or built-in keypad
- Four input slots for Optional Input Modules

## List of components

Ensure the following components were received with the projector.

- IR remote keypad (includes two, 1.5V AA batteries and an XLR to mini-stereo cable conversion to wired)
- Line cord
- Lens mount security screw (M6 x 10 mm long, Qty. 2)
- Lens mount security screw (5 mm Hex, Qty. 1)
- Warranty card
- Web registration form

## Product documentation

For installation, setup, and user information, see the product documentation available on the Christie Digital Systems USA Inc. website. Read all instructions before using or servicing this product.

1. Access the documentation from the Christie website:
  - Go to this URL: <http://bit.ly/2OsZQ2I> or <https://www.christiedigital.com/en-us/business/products/projectors/3-chip-dlp/m-series>.
  - Scan the QR code using a QR code reader app on a smartphone or tablet.



2. On the product page, select the model and switch to the **Downloads** tab.

## Related documentation

Additional information on the projector is available in the following documents.

- *M Series Installation and Setup Guide (P/N: 020-101941-XX)*



- *M Series Product Safety Guide (P/N: 020-102690-XX)*
- *M Series Service Guide (P/N: 020-100551-XX)*
- *M Series Serial API Commands Technical Reference (P/N: 020-100224-XX)*

# Operating the projector

Learn how to operate the projector.

## Controlling the projector

Understand the controls and switches used for basic projector operation once it is properly installed, aligned and configured by a Christie accredited service technician.



**Warning!** If not avoided, the following could result in death or serious injury.

- **LASER RADIATION!** Do not look directly into the laser beam of the remote.

The projector is typically controlled using either the remote or built-in keypad. While each of the keypads provides complete control of the projector, they differ slightly in their arrangement of keys and in what functions can be accessed directly with a key press rather than requiring use of the menu system. You may find one keypad more convenient than another for your specific installation and application.

- **Remote keypad**—For wired or wireless control up to 25 feet (8 m) away. The remote keypad controls the projector by way of wireless communications from a battery-powered infrared (IR) transmitter. Use the remote keypad the same way you would use a remote keypad supplied with a TV or VCR. When pressing a function key, direct the keypad toward the projector's front or rear IR sensor. One of the two IR sensors on the projector detects the signal and relay the commands for internal processing. A laser pointer is built into the remote keypad.
- **Built-in keypad**—Located at the side of the projector.

Keep these guidelines (common to both keypads) in mind:

- Press keys one at a time; there are no simultaneous key combinations required. Use Power, Shutter, and OSD functions by doing one of the following:
  - Press and hold the button for two seconds.
  - Press the button twice quickly, followed by pressing either the Up key to switch on or the Down key to switch off once.
- In serial networks, pause briefly between adjustments to make sure that more distant projectors can keep up with the commands. If you press a key while the projector is still responding to the previous action, such as during power-up, the second key press may not take effect.

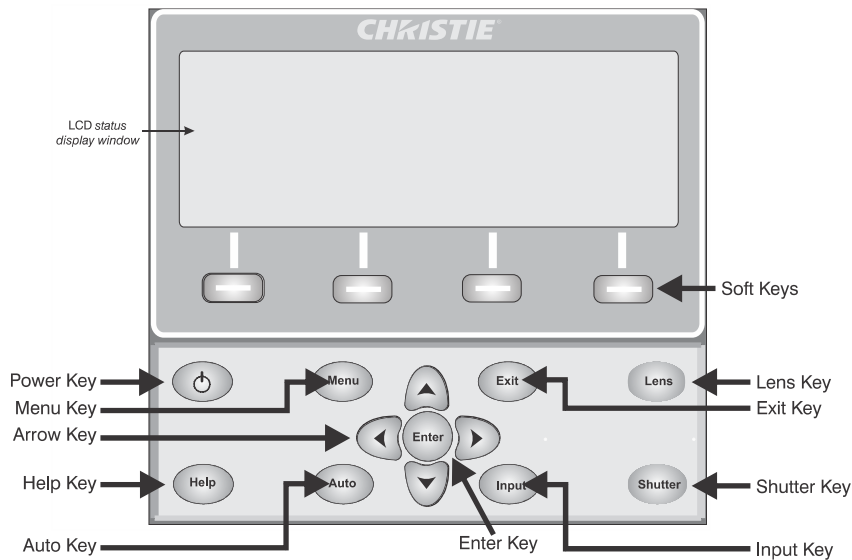
As an alternative to using a keypad, most projector functions can be controlled remotely, typically at a controller such as a PC, through a web interface.

- **ASCII Messaging**—Connect a serial link between your controller and the RS232 or RS422 port (recommended), or open an Ethernet socket, for example Telnet, between your controller and the valid projector address. Valid ASCII codes and messages are documented in *M Series Serial API Commands Technical Reference (P/N: 020-100224-XX)*.
- **Web Interface**—Connect the PC to the projector's Ethernet port. In the web browser, enter the IP address of the projector you wish to control. The default login ids are: admin, service, and guest.

Up to a maximum of three users can connect at any given time. Two users can use the same account to log in. Each user sees a different set of tabs. The default passwords can be edited by an administrator or a service user in the Admin tab. Guest users do not see this tab. Basic operations of the projector can be controlled from this interface and the Virtual OSD can be accessed from here.

## Using the built-in keypad

The built-in keypad has a LCD status display window which displays all states of the keypad controls.



The LCD displays status information when the projector is powering up and when the projector is cooling down. The display shows the state of the keys, menu structure, and menu items.

## Using the wired remote

Convert the remote keypad into a wired remote keypad using any standard 3-pin XLR cable (male to female).

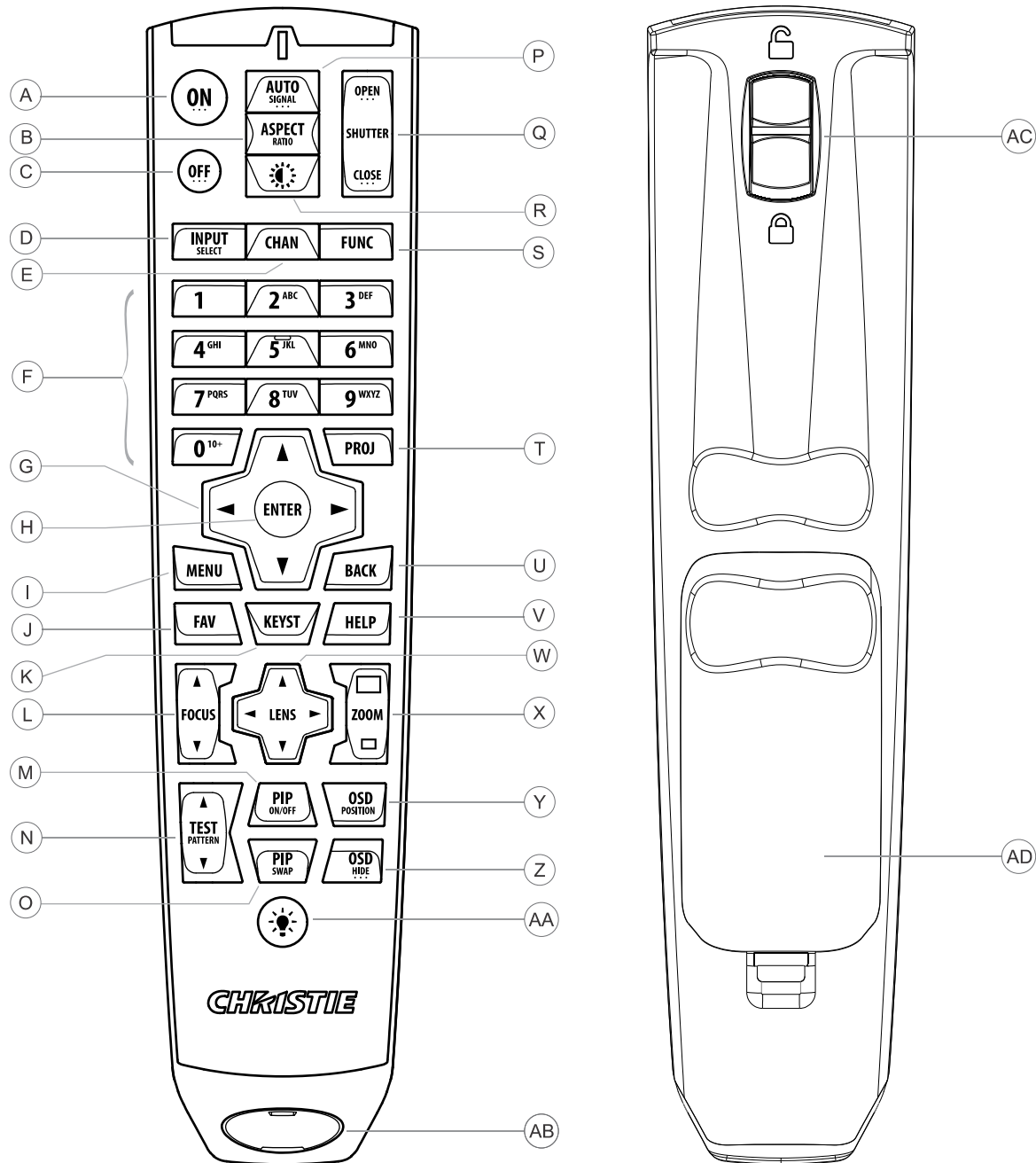
Connect one end into the remote and the other to the XLR connector on the Wired Keypad input panel. The wired remote is recommended when:

- The built-in keypad is inaccessible.
- The lighting conditions are unsuitable for proper IR transmission

## IR remote keypad

The IR remote keypad controls the projector by way of wireless communications from a battery-powered infrared (IR) transmitter.

To use the IR remote, direct the keypad toward the projector's front or rear IR sensor and press a function key. One of the two IR sensors on the projector detect the signal and relay the commands for internal processing. The remote also offers a connector for wired connections to the projector.



Button	Description
A	Powers on the projector light source.
B	Opens the aspect ratio dialog.
C	Turns off the light source and puts the projector in standby.
D	Selects an active or inactive input on any slot.
E	Not supported.

Button	Description
F	Enter a number, such as menu, item index or value.
G	Use the arrows to navigate within a menu or to adjust settings.
H	Selects a highlighted menu item and changes or accepts a value.
I	Toggles the menus on/off.
J	Not supported.
K	Opens the keystone dialog.
L	Adjusts the lens focus.
M	Not supported.
N	Displays a test pattern.
O	Not supported.
P	Optimizes the image automatically.
Q	Opens or closes the shutter.
R	Not supported.
S	Initiates a custom action when a number is selected.
T	Selects a projector in multi-projector installations.
U	Returns to the previous menu level or exits menus if at the top level.
V	Displays context-sensitive help.
W	Arrows adjust the lens offset.
X	Adjust the lens zoom.
Y	Opens the on-screen display position menu.
Z	Shows or hides the on-screen display menus.
AA	Turns the remote backlight on.
AB	Male 3-pin XLR connector for wired option.
AC	Lock/unlock the keypad.
AD	Battery door.

## Logging on to the projector

Before logging on to the system, ensure that the appropriate language is selected.

The language selection only affects the web user interface. The language used by the on-screen display (OSD) is not affected.

1. Open your web browser and type the IP address (in the address bar) assigned to your projector.
2. In the upper left- hand corner, select the appropriate language.
3. Type your username and password. Both entries are case-sensitive.

4. Click **Login**.

## Managing users

Learn how to create new user accounts, and how to remove the accounts. A user account is a set of credentials consisting of both a user name and password that allows access to projector settings.

### Creating a user

Adding a user account allows users to access projector menus.

1. Click **Admin > Users**.
2. Click **Add User**.
3. Type the username and password.  
Do not use capitalization for usernames or passwords. If capitalization is used for the username or password, it is automatically converted to lower case. Usernames can be a minimum of four and maximum of 32 characters. Passwords can be a minimum of four and maximum of 128 characters.
4. Re-type the password.
5. Click **OK**.

### Changing a password

Periodically change a user account password to limit access to projector menus and functionality to authorized users.

1. Click **Admin > Users**.
2. Select the user.
3. Click **Change Password**.
4. Complete the Password and Re-type Password fields.
5. Click **OK**.

### Deleting a user

To prevent access to projector menus and functionality, delete a user.

1. Click **Admin > Users**.
2. Select the user that you wish to remove.
3. Click **Delete User**.
4. In the confirmation dialog click **Yes**.

## Navigating the web user interface

Understand the areas of the web interface.

Most of the projector controls are accessed from within the menu system. Several groups of related functions are selectable from the Main menu.

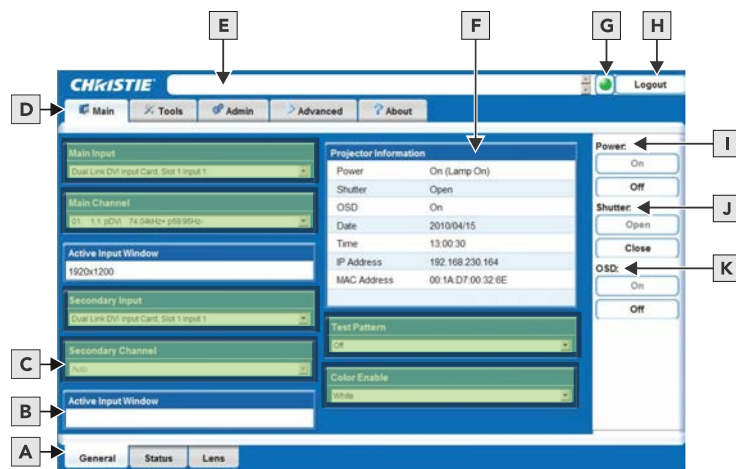
On the remote keypad, enter the number that corresponds to the function menu you want to access, such as 2 for the Image Settings menu. Or use the Up/Down Arrow Key on any keypad to highlight the required option, then press **Enter**. The corresponding function menu or pull-down list of further options appear.

With a function menu displayed, enter a menu option number for any numbered option, or use the Up/Down Arrow Key to highlight the required option and then press **Enter**. Long menus have a scroll bar on the right; use the arrow keys to access the remainder of the menu. Locked items or items that do not pertain to the current action or condition appear dimmed and cannot be selected.

If no signal is present, all source-dependent adjustments are disabled. After 15 minutes of inactivity, the projector leaves the menu system and returns to the presentation. When finished with a function menu:

- To return to the previous screen press **Exit**.
- To leave the menu system and return to the presentation, press **Menu**.

When navigating the web interface, it is not recommended that you use the web browser navigation functionality (such as, the Back and Forward functions) as this causes you to lose your web connection. Christie recommends you navigate using the application interface and related functionality detailed in this section.



A	Secondary Tabs (specific to a primary tab) located along the bottom of the Main window.	G	Status Indicator displays the overall status of the projector, based on the 12 categories of information available.  Click the Status Indicator LED to display the Status window and obtain more information about any current errors and warnings.
B	Active Input Window section is read-only.	H	Logout button (located at the top right corner of the web browser) is used to log you off of the web user interface and the projector.
C	These sections provide list selections.	I	Power section contains an On and Off button. Only one is enabled depending on the current powered state of the projector.
D	Primary Tabs located along the top of the Main window.	J	Shutter section contains an Open and Close button. Only one is enabled depending on the current state of the projector's shutter.

E	Current Status Bar provides information messages according to the current status of the projector.	K	OSD (on-screen display) section contains an On and Off button. Only one is enabled depending on the current state of the projector's on-screen display.
F	Projector Information section is read-only.		

## Setting the date and time

Configure the date and time of the projector.

Any change to the date and time resets the projector real-time clock.

1. Click **Configuration > Date & Time**.
2. Change the date and time.
3. Click **OK**.

## Changing the language used for menus

Choose the available language to use in the projector menus.

In the **Configuration** menu, select the language from the list.  
The change takes effect immediately.

## Adjusting the menu appearance

Change the appearance, content and/or location of on-screen menus and messages.

1. Select **Configuration > Menu Preferences**.
2. Configure the following:
  - **Large Menu Font**—Enter a check mark to enlarge menus and their text.
  - **Menu Location**—Use the pull-down list to choose a pre-defined default or customized location for the display of all on-screen menus.  
To create a custom menu location:
    - a. Choose a preset that is closest to the desired location.
    - b. Adjust **Horizontal Shift** and **Vertical Shift** slide bars to move the menu to the desired location. Avoid locations too close to a corner or edge to prevent cropping of larger menus.
  - **Display Automatic Message Boxes**—Enable or disable the pop-up of automatic message boxes. These are messages to the user that are not directly triggered by user actions. Examples are signal information, function limitation, or auto calibration message boxes.
  - **Display User Message Boxes**—Enable or disable the pop-up of message boxes that are directly triggered by user actions, for example gamma or lens control message boxes.
  - **Display 3D Message Boxes**—Enable or disable message boxes that are triggered by 3D setup errors.
  - **Display Error Messages**—Choose how to be notified of errors detected in either the incoming signal or projector.



- **Screen** or **All** (default) to see brief on-screen messages. This is recommended during setup or testing of the projector.
- **Serial Ports** to receive messages through RS232 or RS422 serial communication only.

To hide error message displays, such as during shows and presentations, select **Off** or **Serial Ports**.

- **Splash Screen Setup**—Choose when to display a special introductory splash screen image, such as your company logo, graphic or message.
  - **Always Off**—A splash screen never appears
  - **Start-up Only**—The splash screen logo appears at projector start-up only.
  - **Start-up And No Signal**—A splash screen appears at start-up and at any time when there is no signal.

To add your own splash screen in addition to the default Christie logo splash screen, use the Web UI to download the desired bitmap (.bmp) file to the projector. This overwrites any other user splash screen that has been downloaded. Only one user splash screen can be saved in the projector.

- **OSD Transparency**—Check this box if you want the OSD menu backgrounds to be transparent.
- **Menu Type**—Select the **Basic** or **Advanced** menu type from this list box.
  - The **Basic** menu setting gives a small number of the most frequently used menu items.
  - The **Advanced** menu setting gives the menu options.
- **Splash Screen**—Choose which splash screen is to be used; the default or user downloaded splash screen.
- **Cascading Menus**—Enable or disable cascading menus. When disabled, a single menu level is displayed on the OSD at a time.

## Uploading a logo file

The projector must be powered on to enable the Upload drop-down list.

1. Click **Admin > System**.
2. To open the Choose file window, click **Upload Browse**.
3. Locate and select the file to upload from a network drive location or from a hard drive.
4. Select **Logo** as the file type.

The file must be a 24-bit bitmap file to enable the Logo Position and Background Color section.
5. Enter the position in the X and Y fields.
6. Click the color square and choose the background color from the color palette.
7. Click **OK**.

The color square changes to the selected color.
8. Click **Upload**.
9. In the Display Name field enter a descriptive name.
10. To confirm the upload click **Yes**.

## Setting the power management parameters

Configure the projector to reduce the amount of power used.

1. Select **Configuration > Power Management**.
2. Configure the following:
  - **LCD Backlight**—The backlight for the LCD has three states. **Always On**, **Always Off**, or **Timer**. The backlight turns on again when any key on the LCD is pressed or if an alarm is raised.
  - **LCD Backlight Timer**—Sets how long the LCD backlight stays on (in seconds) when in timer mode.
  - **LCD Backlight Level**—Sets the LCD backlight brightness level. Maximum 25/Minimum 0.
  - **Auto Power Up**—If there is an AC power interruption, while Auto Power Up is enabled, the projector resumes operation in the same state as it left off. If the lamps are on and an image showing when AC power is lost, the projector automatically powers back up with the lamps on and an image shows when AC is restored.
  - **Auto Shutdown Enable**—When Auto Shutdown Mode has been selected, and no projector activity has been seen for the activation time-out period, the projector enters a power saving mode in which the lamps dim and the shutter closes.  
If this condition persists for an additional time-out period, the projector automatically goes to Standby mode. The presence of any activity within this combined interval cancels Auto Shutdown and returns the projector to normal operation.
  - **Turn Off Image After (Min)**—Sets the activation interval (in minutes) for Auto Shutdown. If all activity (input signals, web or serial port activity, key presses) is lost for this length of time, and Auto Shutdown is enabled, an Auto Shutdown cycle begins.
  - **Enter Standby After (Min)**—Sets the interval (in minutes) between starting Auto Shutdown and entering Standby mode. Once Auto Shutdown has been entered, and all activity continues to be absent for this interval, the projector automatically enters power Standby mode.
  - **Lamp Regeneration Start Time**—Sets the time of day (in 24 hour format) when the regeneration cycle starts. For 24/7 operation, the lamp regeneration cycle is required or lamp life is reduced.  
In Dual Lamp mode, the cycle is performed on each lamp separately. The second lamp waits for the first lamp to come back on before it begins the cycle. In single lamp mode, the projector goes into Standby mode for the regeneration cycle. The regeneration cycle runs for 15 minutes for each lamp. The lamp(s) must run for a minimum of 24 hours or the regeneration cycle is skipped.
  - **Over-temp Fan Assist**—Causes all fans to come on at full speed if any enabled thermal sensor has an over-temperature fault. This may help to prevent an emergency shutdown if the extra cooling can bring the temperature within limits before the shutdown occurs. The fan assist causes increased noise levels due to the simultaneous full speed operation of all the fans. Normal operation resumes when all over-temperature conditions are removed or fan assist is turned off.

## Configuring the lens

Identify the settings for the lens.

1. Select **Configuration > Lens Settings**.

2. Configure the following:

- **Intelligent Lens System**—Enables the Intelligent Lens System (ILS). When enabled, the lens position (horizontal, vertical, focus, and zoom offsets) are stored per channel. If you change channels, the lens position changes as the new signal is being displayed. When ILS is not enabled, the lens is controlled independently of channels or input signals.
- **Manual Zoom/focus**—When this control is selected, the holding current is removed from the zoom and focus motors so that they can be changed manually. Zoom and Focus should not be adjusted manually when this control is not selected, as this results in damage to the motors.
- **Calibrate**—The lens calibration procedure is needed each time a new lens is installed in order for the ILS feature to perform reliably. This procedure calibrates; horizontal, vertical, focus, and zoom offset movements.
- **Lock All Lens Motors**—Prevents all lens motors from moving. It disables the Zoom, Focus, Horizontal and Vertical Position settings, effectively locking out any changes and overriding all other lens features. This prevents accidental lens position changes in multi-projector installations.
- **Calibrate On New Lens**—Prompts for a lens calibration each time a lens is inserted. The user is always prompted before starting the calibration.
- **Calibrate On Startup**—Check this box to initiate a lens reset procedure on every power-up. Use this if the lens is subject to manual movement between power sessions.
- **Home Position**—Returns the lens to the horizontal and vertical home position. Focus and zoom are unaffected.
- **Calibration Status**—Displays the current lens calibration status.

## Configuring the lamp

Learn how to set up and work with a lamp.

This section provides information and procedures for optimizing lamp performance. Optimizing lamp performance is recommended to make sure you receive the brightest, most uniform image possible for the life of the lamp.

## Selecting the lamp operation mode

Specify how the lamps should be used.

1. Select **Lamp > Lamp Operation**.
2. Select one of the following modes:
  - **Lamp 1 single lamp use or Lamp 2 single lamp use**—Only uses the lamp specified. If the selected lamp does not strike, then the projector does not turn on.
  - **Dual Lamp Use**—Uses both lamps together. The projector stays in this operational mode even if only one lamp successfully ignites. If both lamps fail to ignite then the projector goes back to standby.
  - **Auto-Select a Single Lamp**—Ignites the lamp with the fewest recorded hours of on time.

## Selecting the lamp mode

Select between one of the three different lamp modes.

1. Select **Lamp > Lamp Mode**.
2. Select one of the following modes:
  - **Maximum Brightness**—Sets the lamp to run at its highest power level.
  - **Constant Intensity**—Maintains a specific brightness level over time. The brightness level can be adjusted with the Intensity control. As the lamp ages, the projector increases power to maintain the desired brightness. This option is disabled if LiteLOC calibration has not been performed.
  - **Constant Power**—Maintains a specific power level for the lamp. The power level can be adjusted with the Power controls.

## Specifying the amount of power sent to the lamp

Extend the lamp life by set the amount of power (in Watts) sent to the lamp.

This control is only enabled while in Constant Power mode.

1. Select **Lamp > Power**.
2. Adjust the amount of power sent to the lamp.  
This slide bar does not update in real-time when operating in Maximum Brightness or Constant Intensity mode.
3. To see the amount of power being applied to the lamp while in Maximum Brightness or Constant Intensity, select **Status > Lamp Info**.

## Setting the target brightness

Adjust the target brightness for the LiteLOC system as a percentage of the maximum brightness of the lamps.

This control is only enabled while in Constant Intensity mode.

1. Select **Lamp > Intensity**.
2. Adjust the target brightness.

## Configuring lamp failover

Identify the behavior when the currently operating lamp turns off during normal operation or if the currently selected lamp fails to ignite.

To have the projector automatically turn on the other lamp, select **Lamp > Single Lamp Switch on Fail**.

This control is only in effect while in the following modes:

- Lamp 1 single lamp use
- Lamp 2 single lamp use
- Auto-select a single lamp

A brief period of no light occurs before the other lamp ignites and warms up sufficiently. The operational mode of the projector may change from Lamp 1 single lamp use to Lamp 2 single lamp use or visa versa with the option enabled. For example: If lamp 1 fails to ignite and lamp

2 ignites successfully, then the operational mode changes to Lamp 2 single lamp use. 3) This option does not change the operational mode if it is set to Auto-select a single lamp.

## Configuring the HDMI output options

Identify the behavior of HDMI signals.

1. To directly pass-through the HDMI input signals from the same Twin HDMI Input Card, select **HDMI Output Loop Source > Direct Loop**.  
The Input1 signal is looped to Output1 and the Input2 is looped to Output2.
2. To loop the main and secondary video to the outputs, regardless of which card these signal originate from, select **HDMI Output Loop Source > Main/Secondary Loop**.  
The main video signal is looped to Output1 and the secondary video signal is looped to Output2.
3. To shut off the HDMI outputs completely, select **HDMI Output Loop Source > Disable**.

## Looping video signals

In situations where a Twin HDMI Input card is being used to loop signals out to another projector, Standby Active Loop-Through ensures that video signals continue to be looped out when the projector enters standby power mode.

When the projector is in standby mode, and Standby Active Loop-Through is selected, limited channel control is available—inputs can be switched, perform auto setup and some limited input settings can be modified.

## Performing diagnostics and calibration

To assist with diagnostics, configure the projector settings.

1. Select **Configuration > Diagnostics & Calibration**.
2. Configure the following:
  - **Test Pattern**—Choose the desired internal test pattern to display, or select OFF to turn off a test pattern. Alternatively, use the Test key for cycling through test patterns.
  - **Grey Level**—Set the level of grey for displaying in the full grey field test pattern.
  - **Freeze Image**—Enter a check mark to freeze (stop) an image on a single frame. Use this diagnostic tool to examine in detail a still version of an incoming image that cannot be frozen at the source. For example, in moving images it is sometimes difficult to observe artifacts such as external de-interlacing/resizing and signal noise. Remove the check mark to return to normal.
  - **Color Enabled**—Select which color(s) you want to see. Use this while working with color temperature, input levels or other special setup parameters. Colors can be enabled/disabled by entering the corresponding function code listed on the back of the standard remote keypad.
  - **Input Peak Detector**—A fast method for defining individual input levels, and improving the accuracy of input levels set by the Auto Input Level function. Enabling the Peak Detector activates a special operating mode for detecting only pixels that are considered black or white—all other levels are displayed as a mid-level grey. When used with a 16-

step grey scale pattern in which the two black and white bands are known to be at opposite edges of the image, you can watch these isolated areas while adjusting individual black levels and input drives until both bands are just visible. Images from this source display correct blacks and whites without crushing or washing out. If using Peak Detector with PIP, both images must have the same color space.

- **Input Level Detector**—Enable specific thresholds for blacks and whites. Input levels that fall below a specified level value (see below) are displayed as black, and all others are displayed as white. To use:
  - a. Enable **Input Level Detector** and display a continuous grey scale.
  - b. Set **Level Detector Threshold** to near black (such as 200).
  - c. Adjust Offsets to minimize area of black stripe.
  - d. Set **Level Detector Threshold** to near white (such as 800).
  - e. Adjust Gains to minimize area of white stripe.
- **Level Detector Threshold**—Define the value to be used by the Input Level Detector in recognizing blacks and whites.
- **Aspect Ratio Overlay**—Check this box to display an overlay pattern over the image. The overlay shows the boxes corresponding to the size and shape of different aspect ratios.
- **Test Pattern Color Swap**—Swap the green and red color when drawing the Grid test pattern. This may be helpful when adjusting convergence on the projector.
- **Calibrate LiteLOC**—The LiteLOC calibration process must be run to calibrate the LiteLOC sensor on all model types. Constant Intensity mode cannot operate correctly if the calibration has not been performed. The calibration must be done in Dual Lamp mode, after the lamps have warmed up for at least five minutes. The shutter closes for the duration of the calibration, and automatically open again when the calibration is complete.

# Managing channels

The projector stores and recalls up to 99 different channels (source setups) for a variety of inputs. This memory feature allows you to define and use a variety of customized setups.

- **Input**—An input is a source physically connected to the projector, and describes the source signal and which input slot it is connected to.
- **Channel**—A channel is a collection of measurements, locations, and settings that tailor the display of a signal to your specific needs. Since source types and applications can vary greatly, adjust and define a wide variety of parameters such as brightness, contrast, and size to customize and optimize the display from or for a particular source. For example, the display settings you choose for a VCR source may be very different from those you choose for a high-resolution computer source.

Depending on what you have defined, each physical source connection (such as, input at the projector) can have several different channels associated with it.

Once you have adjusted a display parameter, such as pixel tracking or contrast, all current settings are collectively stored in the projector's memory as a unique two-digit channel, such as 09. You can have numerous distinct channels available for the same input, any of which can be selected by using the Channel key on the keypad followed by the two-digit channel number.

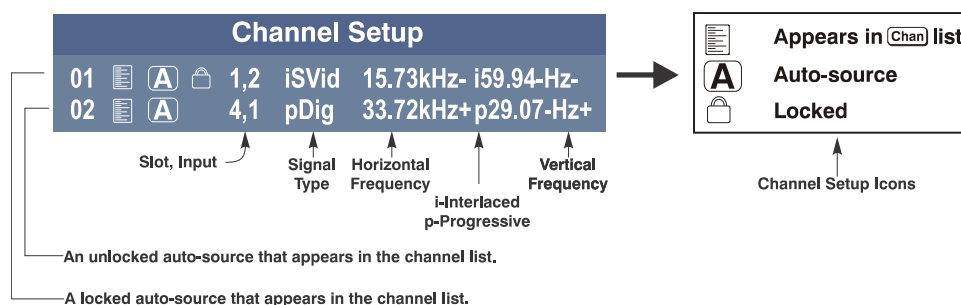
The Channel key may display a channel list or not, depending on what you have defined for the Display Channel List.

## Displaying a list of channels

All available channels are listed in the Channel Setup menu, which describes how each channel can be accessed and provides access for editing, copying, and deleting channels.

The channel setup icons list all defined channels. The far left column lists channel numbers defined. The values in the far right columns indicate horizontal and vertical frequencies or if there is a defined name for a channel, it appears here. The H and V frequencies do not appear if a name has been defined for the channel; instead the name is only seen. The H and V frequencies are inserted as, the name when the channel is first created. The vertical frequency is displayed with the sync polarity. The remaining columns pertain to each signal type; such as, input number, slot location, a variety of icons indicating access to each channel, and an abbreviated description of each signal type.

The channel list or the Channel Setup menu identifies signal types abbreviations as defined in the following table. Composite Sync on the H/C input or the V input (four-wire). These abbreviations are preceded by either an i (interlaced signals) or p (progressive signal).



The first five items in this table are analog RGB with various sync combinations indicating Sync Source when editing the channel:

Abbreviation	Signal types
—	No Sync
4WH	Composite (four wire) on HC input
4WV	Composite (four wire) on V input
SG	Sync-on-green (four wire)
5W	Separate H,V (five-wire)
5WR	Separate H,V swapped (five-wire)
SVid	S-Video
CVid	Composite Video
Dig	Digital
DSDI	Digital Dual Link HD-SDI
DVI	Digital DVI
HDMI	Digital HDMI
HSDI	Digital HD-SDI
SDI	Digital SDI
3GA	Digital 3G-SDI (Level A)
3GB	Digital 3G-SDI (Level B)
DP	DisplayPort

1. To display the Main menu, press **Menu** from the presentation level.
2. To display the Channel Setup menu, press **3** or move the highlight to the Channel Setup option and press **Enter**.
3. To see the remaining channels not visible in the initial display of channels, press the **Up** and **Down** keys.

## Creating a channel

To use a new source with the projector, a new channel must be created so that the projector responds to an input signal from that source.

A new channel can be created automatically, or it can be copied from an existing channel and then edited as necessary.

When you select a direct input (Slot 1, Slot 2, Slot 3, or Slot 4), any existing channels in the projector are searched for matching input and signal parameters—this only occurs if Auto Source is enabled on these channels. If no match to the incoming input signal is found in currently defined channels, a new channel is temporarily created based on factory-defined defaults for this type of signal. The channel number assigned is the lowest available number from 01-99.

Note the following:



- An automatic channel is discarded unless one or more of its parameters are changed and will not appear in the channel list (see below).
- If two channels have the same distinguishing source characteristics except for the reversal of sync connectors (H-sync and V-sync, are switched), they are still defined as distinct channels.
- You cannot define a new channel without an incoming signal.

## Selecting a channel

Learn how to select a channel.

1. Select a channel at any time by pressing **Channel**.  
The current channel is highlighted in the channel list, or, if the current channel is hidden, the first channel in the list is highlighted.  
Channels created automatically do not appear in the channel list unless a parameter for the channel has been changed.
2. To change to another channel, type the two-digit channel number or move the highlight to the channel and press **Enter**.
3. To hide a channel from appearing in this list, edit the channel. Such a channel can still be selected by entering its number as shown below.

Current Channel#  
↓

Main Channel: 01			
01.	1,2	iSVid	15.73kHz- i59.94-Hz-
02.	4,1	pDig	33.72kHz+ p29.07-Hz+

↑ Channel#    ↑ Slot Input    ↑ Signal Type    ↑ Horizontal Frequency    ↑ i-Interlaced / p-Progressive    ↑ Vertical Frequency

## Selecting an input

Learn the different methods for selecting an input.

To select an input, do one of the following:

- Press the **INPUT** key.  
This displays a list of the four slots, with the card type and input signal type in each slot. The currently selected input for the main image is highlighted. Scroll up or down through the list and press ENTER to make a new selection. Press the INPUT key again to show the list and allow the selection for the PIP/Secondary image. Repeatedly pressing the INPUT key toggles between the main and PIP/Secondary image.
- Press the appropriate direct SLOT key to quickly display one of the inputs on the selected slot to the main image. This does not bring up any menu selection, and is only applicable for the main image.
- To select the source of the image for the main or PIP/Secondary image select **Menu > Input Switching and PIP > Main Input** and **Menu > Input Switching and PIP > PIP Input**.

The image is displayed according to the following:

- If it is the first time you have used the source/input (or if you used the input but did not define a channel by adjusting anything), the projector recognizes the new input signal based on its frequencies and polarities, automatically displaying an image according to default settings for that signal.
- In general, the image from the new source is as large as possible without losing its aspect ratio. This and other default image settings depend on the incoming source.
- If you used the source once before and changed a display parameter, such as contrast and V-Position, then a channel was automatically created and still exists in projector memory. Using one of the input or slot keys automatically recall this channel, all its setup parameters, and update the display accordingly.
- If more than one channel exists for the input, the image is displayed according to the setup parameters for the first channel with matching characteristics.

## Copying a channel

Copy a channel to create a new channel with similar settings.

1. To activate the Select Channel Operation submenu, in the Channel Setup menu highlight a channel and press **Enter**.
2. Select **Copy** and press **Enter**.

A new channel is created that is identical to original, which still remains, but it is identified with the next available number from 01-99. If you change your mind and do not want to copy the current channel, press Exit to cancel and return to the previous menu. Copying channels is a quick method for creating numerous channels, each of which can then be edited and adjusted for a variety of presentations in the future.

## Editing a channel

Edit an existing channel when the parameters of the input device change.

1. To display the Main menu, press Menu.
2. To display the Channel Setup menu, press 3 or move the highlight to the Channel Setup option and press **Enter**.
3. Select the channel to edit and press **Enter**.
4. Review or edit the following settings:
  - **Name**—An alphanumeric label can be defined or changed here. Channel names can be up to 12 characters in length. The default name is the horizontal and vertical sync frequencies.
  - **Channel**—A two-digit channel number can be changed here. If you enter a channel number that already exists, a message appears indicating that this number is already in use; assign a different channel number. You can define up to 99 channels.
  - **Slot**—1-4, corresponding to which slot in the projector's input panel the source is connected.
  - **Input**—1-6, corresponding to which input on the selected slot the source is connected to.
  - **In Menu**—If checked (default, except for automatically defined channels with unchanged parameters), this defined channel appears in the list available when **Channel** key is pressed. If unchecked, the channel must be accessed through **Channel** on the keypad or

through the Auto Source function. On-screen display of the channel list is an option that must be set in the **Menu Preferences** menu.

- **Auto Select**—If checked, (default), the projector can automatically locate this channel when an incoming input signal matches. If not checked, the projector can locate the selected channel only when it is directly selected with **Channel** on the keypad; a change in input signal does not result in a channel change.
- **Locked**—If checked, all of the image settings for this channel are locked. If unchecked (default), all available image settings can be adjusted. You cannot use Auto Setup with a locked channel.
- **Previous**—Channel Select this option to see or change **Channel Edit** settings for the previous channel in the **Channel Setup** list.
- **Next Channel**—Select this option to see or change **Channel Edit** settings for the next channel in the **Channel Setup** list.

## Deleting a channel

Delete a channel when the settings for the input device are no longer required.

1. To activate the Select Channel Operation submenu, select **Channel Setup**, highlight a channel, and press **Enter**.
2. To delete a single channel, highlight the channel, select **Delete**, and press **Enter**.
3. To delete all unlocked channels, select **Delete Unlocked Only** and press **Enter**.
4. To delete all channels, including those that are locked, select **Delete All Channels** and press **Enter**.
5. In the confirmation dialog, click **OK**.

When deleting multiple channels, the current channel remains but is redefined from projector defaults.

# Using multiple projectors

When working with more than two projectors, work left to right, top to bottom.

When an installation requires multiple projectors, use the RS232 serial ports to daisy chain the units together and control the group with a single keypad or a computer/controller connected to the first projector. In such a network, you can choose to broadcast commands to the entire group, or use the Proj key as desired to limit responses to an individual projector.

Alternatively, you may want to add projectors to a hub on an Ethernet network. For additional information, refer to *M Series Installation and Setup Guide (P/N: 020-101941-XX)*

## Tiling an image over multiple screens

Image tiling allows a single input image to be displayed, spread over multiple screens, with each screen displaying a fraction of the image.

The image is displayed by the  $m \times n$  array of projectors, where  $m$  is the number of rows (1-3) and  $n$  is the number of columns (1-3). This allows the following arrays to be set up:

1x2, 2x1, 1x3, 3x1, 2x2, 2x3, 3x2, 3x3

Projectors are numbered from left to right (left column = 1), and from top to bottom (Top row = 1).

Projector A Row 1, Col 1	Projector B Row 1, Col 2	Projector C Row 1, Col 3
Projector C Row 2, Col 1	Projector D Row 2, Col 2	

1. Set the total number of rows and columns in the array.  
This setting is the same on all the projectors in the array.
2. Set the relative location of the projector within the array by identifying the row number and column number for each projector.
3. Enable Tiling.

## Performing preliminary calibration

All primary colors in the projector are precisely set to pre-established values to ensure that overall color performance is optimized and is as accurate as possible.

Lighting and other environmental factors may slightly change how these colors appear on the screen. While the change is negligible in most cases, you may prefer to recover the originally intended color performance before trying to match colors from several projectors.

In a multiple-projector wall, you want to precisely match color and intensity from image-to-image so that the full wall is as uniform as possible.

1. To achieve consistency use a color meter to measure the native primary colors (red, green, blue, and white) as they appear at the screen.
2. In the Service menu for each projector, record these as Color Primary Settings.  
On the basis of these new values, which are stored in memory, each projector then automatically calculates any necessary corrections to reproduce the original factory colors under the current environmental conditions. This calibrates a projector to its surroundings, compensating for factors such as screen type, lamp and/or ambient lighting, and improves color accuracy and consistency in a group of projectors. It ensures a good starting point for further customizing and matching; however, is not critical for all installations.
3. To return the primaries to the factory-set color, in the Service menu select **Color Primaries** > **Reset to Factory Defaults**.
4. Repeat the calibration process and continue with matching of colors.

## Automatically correcting frame delay issues in tiled images

Frame delay compensation attempts to automatically correct for frame delay issues which may occur in three row tiling.

When enabled, and using three row tiling, the manual frame delay control is disabled.

The features that act differently when Tiling is enabled are:

- The picture-in picture border is disabled.
- Cascading menus are turned off.
- Menus show only five items, with a scroll bar to allow the rest of the menu items to be reached.
- Projector source switching in the array is not synchronized. Therefore some latency can be seen from when the commands are issued to each projector, causing switching to not be as seamless when in a tiling configuration. When using loop-through with the twin HDMI input card to distribute a signal to the tiling array, additional latency in the switching can occur during HDCP repeater negotiations with the source player.

1. To clear tiling settings, press **FUNC+HELP**.
2. Enable tiled warps and keystones through Christie Twist.  
Refer to the Christie Twist User Manual (020-101380-XX).

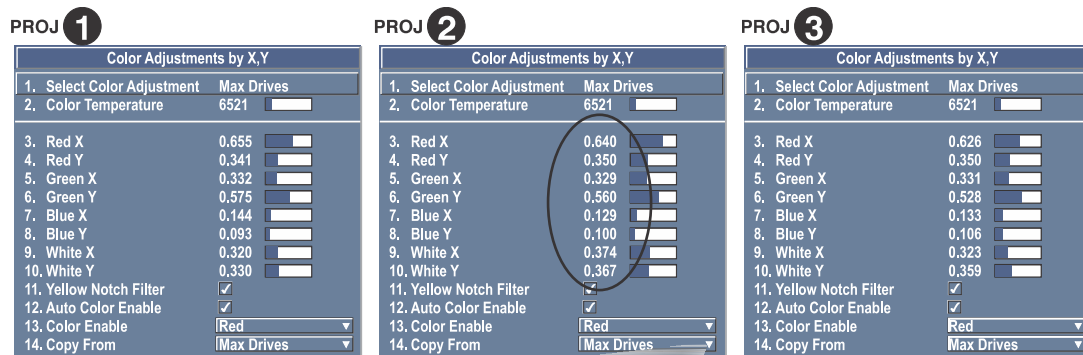
## Refining the displayed colors

In a multiple-projector wall, match color and intensity from image-to-image as precisely as possible so that the full wall is uniform.

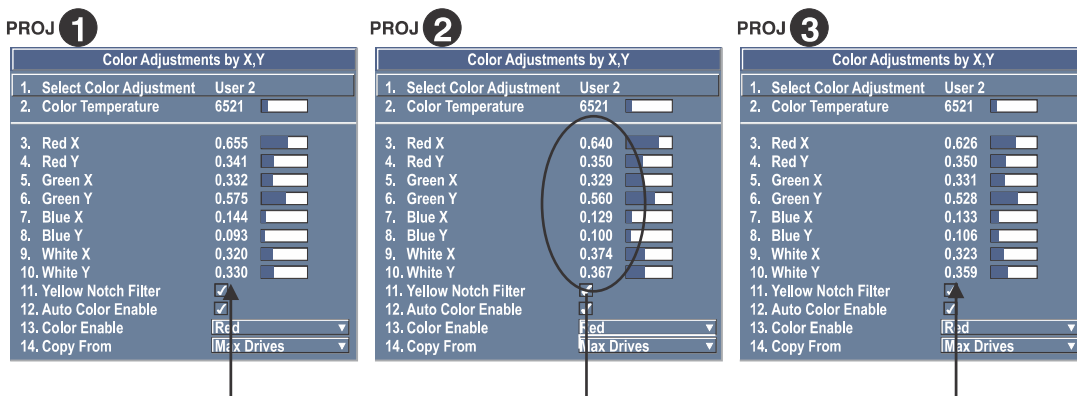
Once the Color Primary Settings are calibrated for the site, use the Color Adjustments by X,Y or Color Saturation menu to further refine each projector's fundamental colors so that the hue and intensity of each color appears the same from one display to another. Once matched, you have created a single new shared range of colors or color gamut that all of your projectors can produce. This palette—

named User 1, 2, 3 or 4—can be applied or disabled for a source at any time throughout a bank of adjacent displays, simplifying both the setup and maintenance of a seamless wall.

1. Set up and optimize all projector settings.  
You can ignore color temperature, since you are redefining color performance in this procedure, but do optimize each projector in every other aspect. Closely align all screen edges.
2. Assign projector numbers to make communications easier.
3. Use the same lamp mode for all projectors, and do the following:
  - a) Set Select Color Adjustment to **Max Drives**.
  - b) Display a full white test pattern.
  - c) Adjust lamp power and optical aperture until adjacent white fields appear the same brightness.
  - d) Display the Color Adjustments by X,Y menus for all projectors.  
Each menu shows the x/y coordinates defining the Max Drives color gamut for this projector.
  - e) Record the color adjustment values from one projector.



4. Create a User color adjustment for the other projectors in the array using the color adjustment values recorded in step 3e.



5. In each projector, adjust x/y coordinates slightly.
  - To match reds, decrease Red X until full field red screens match.
  - To match greens, decrease Green Y until full field green screens match.
  - To match blues, increase both Blue X and Blue Y until full field blue screens match.

For speed, enable **Auto Color Enable**. Each color coordinate selected automatically triggers a full field display of the corresponding color.

Alternatively, use the Color Saturation menu for these adjustments or to fine tune.

These coordinate adjustments move the three color points closer together to establish a shared gamut attainable by all projectors in your group. Adjust only as necessary to ensure that the resulting color palette is as large as possible. When done, lamp power may need to be adjusted.

All screens should now be color-matched. Apply the new user gamut to a source at any time by selecting it in the Select Color Adjustment list accessed in the Advanced Image Settings menu.

## Matching colors across multiple screens

In a multiple-projector wall, precisely match color and intensity from image-to-image so that the full wall is as uniform as possible.

1. In the three Color Adjustment submenus (Red, Green, Blue, and White), set all main values to 1000 and the secondary values to 0, if applicable.
2. Adjust the slide bars as needed.

Adjustments here define new x/y coordinates in the Color Adjustments by X,Y menu. For best results, use this menu after doing the color adjustment procedure.

# Displaying picture-in-picture

Use the Input Switching and PIP menu to enable and define how you want to use Picture-in-Picture (PIP).

To control the primary image, access all picture controls through the Main menu. To control the secondary (PIP) image, access picture controls through the Input Switching and PIP menu. PIP function is disabled in 3D mode.

## Enabling picture-in-picture

Learn how to turn on picture-in-picture mode.

1. On the remote, press **PIP**.
2. Toggle between displaying two sources at once (Main and PIP images) and the primary or main source only.

This check box turns the secondary source on and off.

## Selecting the main and picture-in-picture inputs

Learn how to select a PIP signal source.

1. Select **Input Switching & PIP**.
2. From the list of active inputs, select one to be used as the primary or main image.
3. From the list of active inputs, select one to be used as the secondary or PIP.
4. Toggle the current PIP relationship so that the primary (main) image becomes secondary (PIP), and the secondary image becomes primary.

Swapping is available only when PIP is enabled. You may experience a slight delay when swapping the Primary and Secondary images.

## Configuring the picture-in-picture image

Configure the location and behaviour of the PIP image.

1. To set the location of the PIP (secondary) image in the display, select **Input Switching & PIP > PIP Windows**.
2. To configure the PIP image, select **Input Switching & PIP > PIP Image Settings**.
3. To set the amount of time (in seconds) it takes to fade between images on a source switch and fades in the PIP image, select **Input Switching & PIP > Fade Time**.



## Locking image frames to the input

When the selection is set to Frame Lock, output image frames are locked to the input. When locked, the output is always locked to the primary input, never the secondary image.

1. Select **Configuration > Option Card Settings**.
2. To set the output to close at 60Hz for all sources, select **Free Run**.  
Seamless switching is only available when free run is selected. When switching to a new input with frame locking enabled, the image is black for the short period while the system locks onto the new input.

## Automatically searching for input signals

Configure the behavior when no signal is found for the picture-in-picture.

1. Select **Input Switching & PIP**.
2. To continually search for the next valid signal when no signal is present or when loss of sync occurs on the current user selected input, enable **Auto Input Switching**.  
In the case of multiple signals to choose from, the order is based on slot, followed by inputs on that slot.

# Adjusting the image

Learn how to adjust image geometry so it displays correctly.

The most commonly used options for image adjustments are accessed through two menus: **Size and Position** (Menu 1) and **Image Settings** (Menu 2), both of which appear in the **Main** menu. From either of these two menus, you can change settings affecting the image from the current channel by working with the appropriate slide bars, check boxes and pull-down lists. Exit returns to the previous menu (or to the presentation, if from the Main menu) and accept any changes you may have entered. Settings are saved with the current channel.

Access any of the individual options in these menus by pressing Menu followed by the appropriate two-digit number representing their location in the menu system. For example, press Menu 24 to quickly access the Color Space option in the Image Settings menu.

For certain options, preference may be to use a direct key from presentation level to go directly to a particular option without traveling through the menu system (available for certain display parameters only). For example, press Contrast to access the "contrast" slide bar immediately. Press Exit to return to your presentation.

To hide direct slide bars, disable the Display Slide bars check box in the Menu Preferences menu.

To hide the entire menu system from view, turn off the on-screen display by pressing OSD then the Down Arrow Key.

## Automatically optimizing display parameters

Automatically optimize critical display parameters such as size, position, and pixel tracking based on the type of incoming source.

The best auto setup is obtained under the following conditions:

- Input levels, it is best to have an image with saturated (very Bright) colors.
- Phase, high contrast edges are needed.

To determine active window size:

- Video images should have whites and blacks in the image
- Wide range video images should have content (including white) that extends to all edges of the image.

All digital and decoder option cards do not present an additional auto setup menu since digital hardware provides enough information to perform the correct auto setup.

Analog PC graphics sources (four/five-wire sync) present a list of formats based on the current active lines detected in the video.

Analog Video Sources (three wire sync on green) always have the options Default and Advanced. Video sources use a look up table to determine their format based on video standards. The Advanced auto setup selection measures the start pixel and start line whereas Default uses the table values as is.

To start the optimization, press **Auto**.

In some cases for analog video a menu may appear that presents multiple choices that allows the user to select the format that best suits their source. This selection helps the auto setup

get the correct settings for the tracking and phase controls for analog sources that contain the same number of active lines, but have a different aspect ratios.

## Displaying a test pattern

Display a test pattern to refine and adjust the projected image or diagnose and correct image issues.

- To display a test pattern do one of the following:
  - Press the **Test** key on the remote keypad.
  - On the built-in keypad, press the soft key that displays Test on the LCD display.
  - In the web user interface, select **Configuration > Geometry and Color > Test Pattern**.
- Select a pattern appropriate for analyzing image focus and geometry, such as the Grid test pattern showing the cross-hair centered across the image.

## Changing the size and position of the image

Increase or decrease the size of your image, change its proportion (aspect ratio), move the image to a specific area of the screen, and refine other related parameters.

Use **Size and Position** controls to match the image precisely to the screen used at the site. Changes made in the Size and Position menu are applied immediately and are saved when you exit the menu (press **Exit** or **Menu**).

## Resizing the image with a preset

The same resize presets are available to all HD and SXGA+ screen models. However, the graphics used to describe each preset in this section are of the SXGA+ models only.

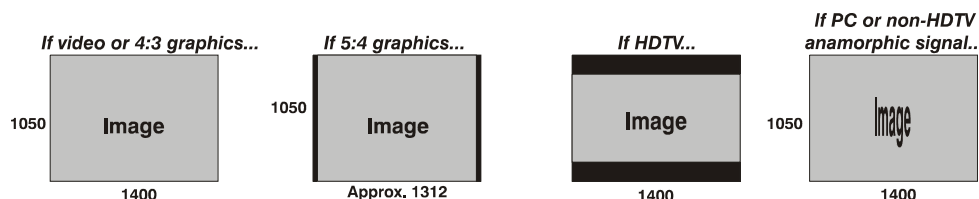
Resize Presets displays an image in its native resolution (no resizing) or resizes the image by maximizing either the height, width, or both height and width, or resizes to the maximum size possible while keeping the original aspect ratio.

Size, Position, and Blanking parameters automatically adjust accordingly or, if Blanking is set first, defines an active input area; Resize Preset scaling occurs in this region of interest only.

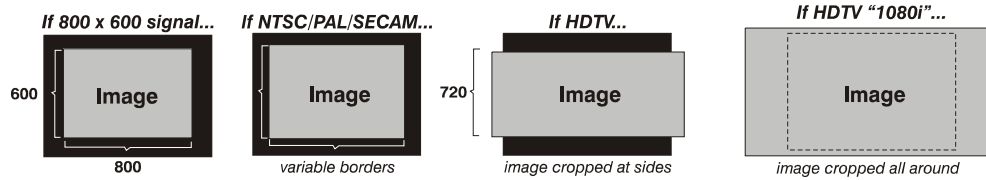
By default, when displaying a new source your image uses as much of the display area as possible for the type of incoming source data, but with minimal or no changes to aspect ratio.

The custom re-size descriptor automatically appears in the Size and Position menu when any of the values for Size, Vertical Stretch, H-Position, V-Position or Blanking do not correspond to those for a preset. This option is not offered in the Resize Presets list.

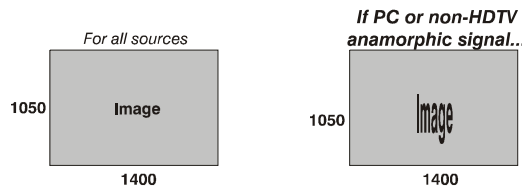
- Select **Size and Position**.
- Select a resize preset.
  - Default**—Centers the image and displays it as large as possible, depending on the type of source.



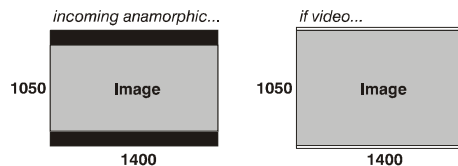
- **No resizing**—Displays the image in its native resolution, which may or may not match the resolution of the projector. For example, for a source with a native resolution of 800 x 600, No Resizing in an SXGA+ projector uses the central 800 x 600 pixels and have a black border. The black border areas are unused areas.



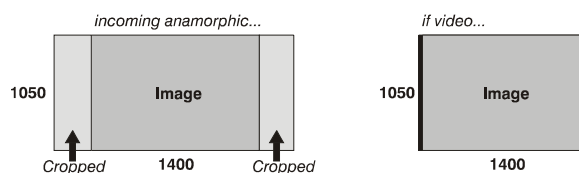
- **Full size**—Uses all pixels for displaying the image, regardless of source or original aspect ratio. Incoming source material having a different aspect ratio than the projector is stretched for display.



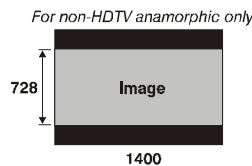
- **Full width**—Fills the display from left-to-right without changing the original aspect ratio of the image. Depending on the source, data at the top and bottom may be discarded (cropped), or the display may have black borders at the top and bottom (called "letter boxed").



- **Full height**—Fills the display from top-to-bottom. Depending on the source, this may create borders.



- **Anamorphic**—Displays an anamorphic image in its native 16:9 aspect ratio. The image fills the screen from side-to-side and be centered between black bars at top and bottom.



## Resizing and positioning the image

Change the size and location of the image.

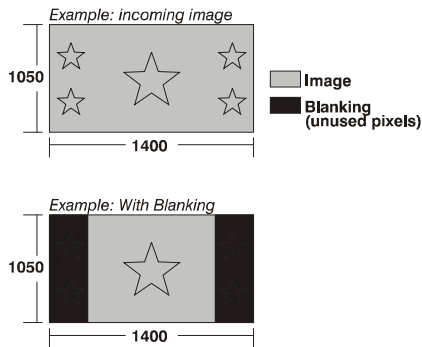
1. Select **Size and Position**.
2. To control both the image width and height in tandem, maintaining the current aspect ratio of the displayed signal data, adjust the **Size**.

3. To change the height of the image while keeping the width constant, altering the aspect ratio of the display, adjust the **Vertical Stretch**.
4. To move the image right or left within the area of available pixels, adjust the **H-Position**.  
The value shown represents where the approximate center of the image lies in relation to the total number of pixels available horizontally. This varies widely according to the signal; watch the image while adjusting.
5. To move the image up or down within the area of available pixels, adjust the **V-Position**.  
The value shown represents the approximate center of the image in relation to the total number of pixels available vertically. This varies widely according to the signal; watch the image while adjusting.
6. To ensure that auto setup for any source maintains the input aspect ratio when the default size is calculated, select **Keep Aspect on Auto Setup**.  
If disabled and the source is not a special case video source where a default stretch is defined, the source is scaled to fit the platform.
7. If the display has steady flickering or several soft vertical stripes or bands across the entire image, adjust the **Pixel Track**.  
Proper pixel tracking ensures that the image quality is consistent across the screen, the aspect ratio is maintained, and that the pixel phase can be optimized. Tracking determines the frequency of the pixel-sampling clock, indicated by the number of incoming pixels per line, so that all pixels generated by a particular source are sampled. By default, the projector samples at the correct frequency for most sources.  
For best results, use a test pattern such as a smooth grey consisting of a clear pattern of black and white pixels, or a similar half on, half off graphic image, such as the Windows 2000 shutdown screen. Adjust the slide bar until the vertical stripes broaden to the point where one large stripe fills the image.
8. If the image shows shimmer or noise after pixel tracking is optimized adjust the Pixel Phase until the image stabilizes and each pixel is clearly defined.  
You may notice that you can stabilize the image at more than one point.  
Pixel phase adjusts the phase of the pixel-sampling clock relative to the incoming signal.  
If some shimmer from a video or HDTV source persists, use the Filter control to remove high-frequency noise from the signal.

## Cropping an image

Blanking defines the size of the active input window, or area of interest, and crops the image so that unwanted edges are removed from the display and changed to black. The range of adjustment depends on the source resolution and other factors.

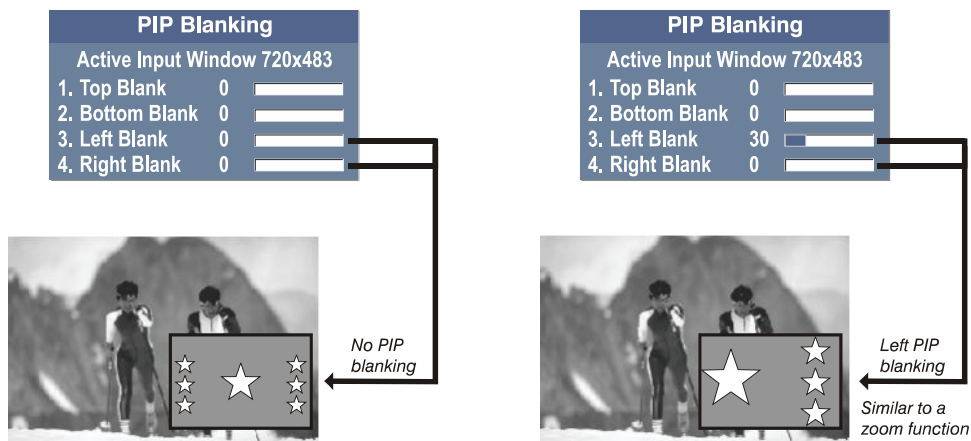
1. Select **Size and Position > Blanking**.  
The Active Input Window value indicates the current size of your displayed data or region of interest as defined by the blanking controls. By default, the projector automatically determines what portion of its full resolution to use, and pixels in the surrounding borders are turned off.



Blanking a picture-in-picture (PIP) image resembles zoom. For example, left Blanking zooms the right side of the PIP image; Right Blanking zooms the left side. There are no black bars.

- To specify a specific active input window size, adjust one or more Blank settings.

For example, if you have blanked (cropped) 100 pixels from both the left and right edges of an incoming source of 1400 x 1050, the remaining active input window is reduced to 1200 x 1050.



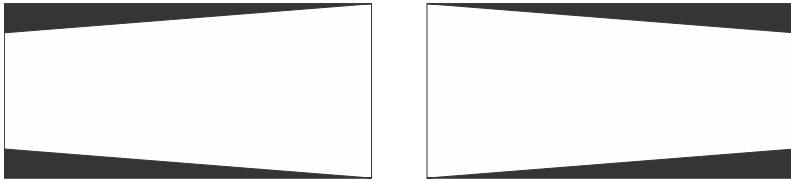
## Correcting a keystoneed image

Keystone is typically caused by tilting the projector in relation to the screen so the lens surface and screen are no longer parallel to each other.

Vertical keystone is used to correct a keystoneed image shape in which the top and bottom borders of the image are unequal in length, and both sides of the image are inclined toward the top or bottom edge.



Horizontal keystone is used to correct a keystoneed image shape in which the left and right borders of the image are unequal in length, and the top and bottom are slanted to one of the sides.



Brightness Uniformity, Edge Blending and Black Level Blending should be disabled before performing Keystone adjustments.

Under certain combinations of extreme keystone coordinates and specific signal frequency, a keystone image may result that is outside the bandwidth limitations of the projector. When attempting to apply the keystone settings, a message appears on the on-screen display, indicating that the bandwidth has been exceeded and the keystone cannot be applied. The cursor co-ordinates for keystone adjustment remains at the failed keystone position. This allows the user to make minor changes and attempt to reapply the corner settings. Either the co-ordinates must be adjusted, or the free run frequency must be changed to fall within the allowed bandwidth.

The **Func+Help** key combination immediately disables the **Keystone**, **Brightness Uniformity**, **Edge Blending**, and **Black Level Blending** features. This is helpful when, in some extreme keystone configurations, some image corruption may appear and/or the menus may not be readable. Although **Func+Help** disables these features, it does not overwrite their settings. If keystone is enabled again, the same image corruption may occur. After pressing **Func+Help**, Christie recommends immediately resetting Keystone settings, which sets all keystone co-ordinates to zero.

1. Enable keystone adjustments by selecting **Geometry Correction > Keystone**.  
This enables the controls for performing 1D or 2D keystone adjustments.
2. Select a test pattern.  
Christie recommends using the grid test pattern.
3. Use the left and right arrow keys to change the Horizontal or Vertical Adjust settings and perform coarse keystone adjustments.  
The corner cursors are a guide as to how the image needs to be adjusted. The outside edge of a cursor is the outside edge of the image. It may not be possible to exactly match the screen dimensions with the horizontal and vertical keystone controls, but these settings can be refined when the 2D keystone settings are adjusted.
4. When adjustment of the corners is complete, click **OK**.  
A message is displayed indicating that the projector is processing the request and the settings are applied to the displayed image. If vertical keystone adjustments have been made, starting to do any horizontal keystone adjustments erase the vertical settings, and vice versa.
5. After the horizontal or vertical adjustments have been made, to retain the settings select 2D Keystone adjustments.
6. Make fine adjustments by adjusting any single corner separately.
  - a) Use the arrow keys to move to the required corner.  
The current corner is displayed in red.
  - b) To select the corner, press **Enter**.  
The current corner is displayed in green.
  - c) Use the arrow keys to move the selected corner to match the screen.
  - d) To save that position for the corner press **Enter** again.
  - e) To adjust all four corners until they match the screen, repeat steps 6a to 6d.
7. To apply the new corner positions to the image select **OK**.

A message is displayed indicating that the projector is Processing request and the settings are applied to the displayed image.

8. To disable Keystone, Brightness Uniformity, Edge Blending, and Black Level Blending, press **Func+Help**.

This is helpful when, in some extreme keystone configurations, some image corruption may appear and/or the menus may not be readable. Although **Func+Help** disables these features, it does not overwrite their settings. If keystone is simply enabled again, the same image corruption may occur.

9. After pressing **Func+Help**, Christie recommends immediately pressing **Reset Keystone Settings**, which sets all keystone co-ordinates to zero.

## Adjusting the main image

Alter the main image without affecting its size or position.

1. Select **Image Settings** and adjust the following:
  - **Contrast**—Contrast increases or decreases the perceived difference between light and dark areas of your image (0-100). For best results, keep close to 50. Start with a lower value and increase so that whites remain bright but are not distorted or tinted, and that light areas do not become white. If the environment lighting changes, an adjustment of Gamma is recommended.
  - **Brightness**—Increases or decreases the amount of black in the image (0-100). For best results, keep close to 50. Start with a high value and decrease so that dark areas do not become black. Conversely, high brightness changes black to dark grey, causing washed-out images.
  - **Yellow Notch Filter**—Yellow Notch Filter (YNF) is a channel based control with an additional global control, which honors the last request. After enabling YNF, switching to a channel that does not use YNF and the YNF filter is removed or disabled. Changes to the global control affect the YNF filter.
  - **Color Space**—Determines how the color components of an analog input signal are decoded for accurate color in the display. Useful only for analog signals and certain digital sources. Although color space for these analog signals is automatically determined by the projector. You may wish to override this and manually set a color space. For some signals, the color space function is entirely automatic and the list is disabled.

Changes made are applied immediately.

2. To save the changes, press **Exit** or **Menu**.

## Configuring the video sources

Learn how to configure video sources.

1. Select **Image Settings**.
2. Select **Video Options** and configure the following:
  - **Enable Decoder (AGC)**—AGC affects decoded video images only. Enter a check mark (default) in most instances. Activate the decoder's AGC circuit to ensure properly bright images. Delete the check mark if a decoded video image exhibits strange color artifacts such as stripes in highly saturated colors, indicating an incompatibility between this source and the AGC.



- Video Standard**—For most available video standards, the projector automatically detects the incoming horizontal and vertical frequencies and sets the projector’s processing of this signal to the corresponding standard. The current video standard name appears in the Video Options submenu, and includes an A if it is auto-detected. To view or select a different video standard from those available to the projector, press **Enter**; any that are disabled have frequency characteristics that differ from those of the incoming signal. Selecting a specific standard forces the projector to process the signal according to this standard.

Best results are obtained with defined channels. Otherwise, switching from one video source to another can sometimes cause slight disturbances in the display, indicating that the Auto function is struggling. Recover by briefly selecting a different video standard, then going back.

Standard	Where used (subject to change)
Standard	Where used (subject to change)
PAL	Most of Europe, China, Australia, some of S. America, some of Africa
NTSC	North America and Japan
SECAM	France, Eastern Europe, most of Africa
NTSC 4.43	A tape-only standard for partially-translated hybrid signals
PAL-M	Brazil
PAL-NC	Argentina, Chile, other Latin American countries
PAL60	
<b>Note:</b> Generally, use Auto for all instances except a poor quality input signal or a black-and-white video signal. To detect and display such signals, select the relevant standard from the list.	

- Input Video Black**—Compensates for incoming elevated black levels present in certain video signals, and ensures that blacks in the display are neither crushed (where dark greys appear black) nor excessively elevated (where blacks appear dark grey). By default, the projector automatically determines the best setting according to the type of incoming video signal:
  - 0 IRE**—Used for DVD output with enhanced black, SECAM, most PAL standards, and Japanese NTSC.
  - 7.5 IRE**—Used for most NTSC video signals.

For some types of video, you can override the setting. The control is disabled for other types of video and all graphics sources. Generally, if black appears crushed when brightness is 50, choose 0 IRE. If black appears excessively elevated, use 7.5 IRE.

- Color**—Adjusts the color saturation level. Lower settings produce less saturated colors, for example a setting of 0 produces a black and white image. If the color level is too high, colors is overpowering and unrealistic.
- Tint**—Adjusts the red/green color hue for true color reproduction of video and HDTV signals. For best results, adjust tint while displaying an external test pattern. It is recommended that tint remain at its default setting.
- Filter**—The proper filter setting is automatically set for virtually all signals, and rarely needs to be changed. Override the only if standard pixel tracking and phase adjustments do not adequately clear up a noisy video signal, or if a graphics signal appears overly soft. Both instances indicate that Filter may be set to the wrong option.

- **Sampling Mode**—Sets the color sampling mode for a digital signal to either YCbCr 4:4:4, RGB or YCbCr 4:2:2. The proper sampling mode is determined automatically by the projector; you can override this setting.
- **Film Mode Detect**—Enables or disables film motion detection. This is only available for interlaced or segmented frame sources.
- **Chroma/Luma Delay**—Affects any incoming composite or S-video signal, delaying the luma signal (intensity) in relation to the chroma (color). In the image, increasing the luma delay moves luma (seen as a shadow where colors overlap) to the right slightly, with colors remaining in place. Decreasing this delay moves the shadow slightly to the left. If necessary for your current source, adjust so that no shadows occur with adjacent colors.
- **Split Screen**—Allows a snapshot of the main image to be presented on the right side or lower part of the screen for evaluation of advanced image processing features. All resizing controls are honored on both images. However, image processing controls such as, Detail, Sharpness, Noise Reduction and Adaptive Contrast only happen on the left side or top image. Changing inputs, channels, or test patterns disables this control.  
Split screen cannot be used in conjunction with either PIP or Tiling. Both PIP and Tiling must be disabled prior to enabling Split Screen control.
- **RGB Quantization Range**—Defines the RGB quantization levels for digital DVI and HDMI inputs using the RGB colors pace. Typically, graphics sources use the full range of levels for the given bit depth (8-bit, 10-bit, 12-bit) and consumer electronics (CE) products typically use a limited range of data within the given bit depth. This control must be set to limited to correct the levels for those CE products that use the limited space. This adjusts what is considered black and white levels in the image; for example for an 8 bit space, full range RGB uses levels 0 (black) to 255 (white).

## Manually optimizing input levels

Adjust the input levels of a source exhibiting overly high black levels, typically caused by a noisy source causing black level spikes.

Because the projector automatically optimizes input levels for all but the most unusual of sources, we recommend that only experienced users use the Input Levels submenu. Before beginning, check that overall contrast and brightness settings are near 50 and that color temperature is properly set up on an internal gray scale test pattern.

Good RGB or input levels—that is, the drives and black levels for each of the three colors, red, green and blue—ensure that images from analog sources other than decoded video have maximum contrast without crushing black or white. By default (and in an Auto Setup), the projector automatically determines the best input levels by monitoring image content and adjusting the controls appropriately. Further adjustment is typically not required to obtain proper blacks or whites. This automatic adjustment requires at least 6-12 consecutive white pixels in the image. Without these pixels, input levels may produce skewed colors, particularly in non-video images.

Input Levels are of limited use with digital signals, but do offer some ability to tweak poorly mastered source materials. Input levels apply for the current source only, but for any color temperature used. Assuming that color temperature has been set up based on the internal test patterns, you can then set up input levels for a given source so that they match the color temperature of the internal test patterns.

These adjustments, serve as a calibration process compensating for differences in sources and cabling, to perfect the source image input levels and eliminate the overshoot and undershoot.

1. Select **Image Settings**.
2. Select **Input Levels** and change the following options:

- **Auto Input Level**—Compensates for incoming out-of-range drives (white) and black levels (black) that would cause crushing of light and dark colors in the image. After entering a check mark, wait for the six slide bar values to stabilize, then delete the check mark and exit. The Auto Input Level is automatically turned off upon exit from the Input Levels Menu. Use only if you are an experienced user and you have an unusual source that you feel needs further color temperature and/or input level adjustment.
- **Black Levels And Drives**—Do not use Input Levels to adjust color temperature. This distorts contrast and brightness functions as well as color temperature.
  - a. Ensure overall Contrast and Brightness settings are set to near 50. This is not required for Auto adjustment.
  - b. Check the color temperature setup using an internal grey scale test pattern, making sure to obtain a neutral grey scale. This is not required for Auto adjustment.
  - c. Confirm that you are using input on an Analog BNC card or a Dual Link DVI card. Input Levels are not applicable for sources going through the decoder. A grey scale is recommended.
  - d. If black levels are too high (and/or whites are too low, which is rare), you likely have a noisy source that is producing skewed input levels. In the Input Levels menu enable **Auto**. Wait for all six values to stabilize. Alternatively, do not use Auto; reduce black levels manually instead. Judge by eye and change one or more of the six levels as necessary to obtain proper blacks and whites. You may want to see only a certain color while adjusting; use the Auto Color Enable option.
  - e. Clear the Auto checkbox and leave the Input Levels menu.
- **Auto Color Enable**—When selected, setting a specific black level or drive to adjust automatically enables the corresponding color in the display. To see all colors, clear the checkbox or to enable a different specific color through the Color Enable control.
- **Clamp Location**—Brightens the image produced from certain high-resolution high-frequency graphic sources. The projector automatically selects the best clamp location for most sources. Use the normal Back Porch location if the image is either sufficiently bright or overly bright.

If the image appears unusually dim, has horizontal streaks across it, or has significant color drift, select **Sync Tip**. This moves the clamping pulse from the normal back porch location (which is likely too short) to the tip of the horizontal sync pulse. Tri Level is typically needed for an HDTV source.
- **Input Peak Detector**—A tool to assist with defining individual input levels, enabling you to accurately set the Input Levels for any particular source with the appropriate image. Enabling the Peak Detector activates a special operating mode for detecting only pixels that are considered black or white—all other levels are displayed as a mid-level grey. When used with a smooth grey scale pattern in which black and white are known to be at opposite edges of the image, you can watch these isolated areas while adjusting individual black levels and input drives until both black and white edges are just visible and distinguished from neighboring pixels. Images from this source display correct blacks and whites without crushing.
  - a. Display a 16 level grey scale test pattern from the required external source, and select **Input Peak Detector**.

The Input Peak Detector initially renders the grey scale as a uniform grey field before adjustment or extreme crushing.
  - b. Display one primary color. To ensure the correct color is displayed for each setting, select **Auto Color Enable**.

- c. For the current color, adjust its corresponding Black level slide bar just until a single band of black appears at one edge of the screen. This band represents the first band of the grey scale pattern, which should be 100% black.
  - d. With the same color still active, adjust its corresponding Input Drive slide bar just until a single band of color appears at the opposite edge of the screen. This band represents the last band of the grey scale pattern, which should be 100% white (or the current color, if a certain color is enabled).
  - e. Check the black band and adjust the black level slide bar if necessary. Adjusting the black levels affects the gain. Only adjust when necessary.
  - f. Repeat steps c and d for the two remaining primary colors. When each primary color shows one optimized black band and white (or colored) band, the input levels for this source are correctly set. Upon exiting the Input Levels menu, the Peak Detector check box clears.
- **Color Enable**—Select which color or colors you want to see in the display, useful while working with color temperature white levels or input levels.

## Correcting gamma settings

Gamma correction can be applied to a specific source to correct for luma encoding.

The Gamma control provides settings per channel that are reapplied every time the same signal is detected, as well as a global Gamma Correction control. The global control offers an offset applied to all channels. This offset is used to compensate for changes in ambient conditions such as ambient light in the room and projected material.

1. Select **Image Settings > Advanced Image Settings > Gamma Settings**.
2. Configure the following options.

- **Gamma**—Sets the base gamma table for a given source. Select from one of the standard tables, a custom gamma function, or select an arbitrary gamma table that has been downloaded to the projector. A separate PC utility is needed to do this.

The 2.22 curve is a power curve typically used to encode graphics and video sources. The standard curve (auto setup default) is a modified 2.22 curve with a small linear section in the black that enhances the detail in darker areas of the projected content.

Alternatively, if neither default is ideal, apply a simple gamma curve by defining a custom power function and slope. For more complex non-standard gamma curves, a user-defined curve created externally and downloaded to the projector can be used (requires separate PC-based Arbitrary Gamma software application to create the table and the Web UI to download it). If any of these special user curves have been installed, their names appear in the Gamma Table pull-down list.

Select Gamma Function from the list to enable the Gamma Function and Gamma Slope controls.

- **Gamma Correction**—Applies a global offset to all gamma settings for each channel. It affects the shape of the curve by performing a linear transform toward a gamma curve of 1.0 while the control is increasing and likewise a linear transform toward a gamma of 3.0 as the control is decreasing. The control should only be adjusted to compensate for ambient conditions. To correct a particular source only, use the Gamma control.
- **Gamma Function**—Defines the base gamma power curve used when the base gamma table value is set to Gamma Function. This value, combined with gamma slope setting determines the base gamma table used as the custom base table. The curve is generally a power curve with a small linear segment at the bottom defined by the slope.

- **Gamma Slope**—Defines a slope to be used for the base custom gamma table for a small section at the bottom of the curve. This slope brings in or out the low level blacks in the image.

## Adjusting the sharpness of the image

Setting detail above the halfway-point can introduce noise in the image. Lower settings can improve a noisy signal.

This command does not take effect unless the minimum change required in the Detail Threshold control is reached.

1. Select **Image Settings > Advanced Image Settings > Detail**.
2. Adjust the following settings:
  - **Texture Enhancement**—Applies texture detail enhancement based on adaptive horizontal, vertical, and diagonal large edge and small edge enhancement processes.
  - **Detail Threshold**—Selects a filter sensitivity to noise. A higher value may improve noisy sources especially for higher settings of detail.
  - **Detail Overshoot**—Minimizes ringing on the enhanced edges detail and texture effects.
  - **Split Screen**—Allows a snap shot of the main image to be presented on the right side of the screen to allow evaluation of advanced image processing features. All resizing controls are honoured on both images; however, image processing controls only happen on the left side image. Changing inputs, channels or test patterns disable this control. PIP and Tiling operation must be disabled prior to enabling this control.

## Selecting the noise reduction filter

Improve noisy sources by applying a filter.

A higher value may improve noisy sources, but it soften the image.

1. Select **Image Settings > Advanced Image Settings > Noise Reduction Settings**.
2. Select a noise filter.
  - **Block Artifact Reduction**—Locates and reduces block edges produced by discrete cosine transform (DCT) based compression processing.
  - **Mosquito Noise Reduction**—Reduces mosquito artifacts around sharp edges in DCT based compression by dynamically adapting to image content.
  - **Split Screen**—Allows a snapshot of the main image to be presented on the right side or lower part of the screen for evaluation of advanced image processing features. All resizing controls and input card features; such as color/tint etc, are honored on both images. However, image processing controls such as the detail-texture, noise reduction and adaptive contrast features, only occur to the left side image. Changing inputs, channels, or test patterns disables this control.  
Split screen cannot be used in conjunction with either picture-in-picture (PIP) or Tiling. Both PIP and Tiling must be disabled prior to enabling Split Screen control.
  - **Full Screen Eye-motion Filter**—Applies the Eye-Motion Filter to the entire screen, rather than applying just to the edge blending.
  - **Eye-motion Filter**—Reduces 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.

## Adjusting the color for the output

Customize the output color.

1. Select **Image Settings** > **Advanced Image Settings** > **Color Settings**.
2. Select the output color adjustment most suited to this input signal.
  - **Max Drives**—All color adjustments are turned off allowing the projector to run at maximum brightness.
  - **Color Temperature**—Sets a color temperature between 3200 and 9300 based on the setting of the color temperature slide bar.  
Expressed in degrees Kelvin [3200K, 5400K, and so on.]. Lower numbers appear reddish white and higher numbers appear bluish.  
Standard settings are:
    - **9300K**—Close to the white of many computer monitors
    - **6500K**—The standard for color video, in both standard and high definition forms
    - **5400K**—The standard for graphics and black and white video
    - **3200K**—Useful if the projected image is to be filmed or shot as part of a studio set illuminated with incandescent lightsFor all color temperatures the color primaries (red, green, and blue) are unchanged and reflect the native colors of the projector.
  - **SD Video and HD Video**—Sets the output color to a specific standard value. Adjusts the red, green, blue, and white.
  - **User#**—Select 1 of 4 user defined sets of color adjustments. The sets are defined in the Configuration menu.

### Related information

*Defining user color gamuts (on page 47)*

## Selecting a color space

Determine how the color components are decoded for accurate color in the display.

1. Select **Image Settings** and press **Enter**.
2. Select a color space.
  - Select **RGB** unless you are using component video.
  - Select **YPbPr (Video)** with a standard definition televised signal (SDTV).
  - Select **YPbPr (HDTV)** with a high definition televised signal (HDTV).
3. When certain RGB signals are first connected, the projector may not recognize them as RGB and incorrectly decodes their color information as YPbPr (video). For these signals, change the color Space to RGB, and then define a new channel for future use.  
These signals can include:
  - RGB signals in NTSC, PAL, SECAM frequency ranges.
  - Scan-doubled sync-on-green.
  - Scan-quadrupled sync-on-green.

## Applying pre-defined color performance settings

The factory-defined primary color levels, which ensure a specific color performance from projector-to-projector, can be calibrated in the Service menu only.

1. Select **Advanced Image Settings > Select Color Adjustment**
2. Select a predefined color performance setting: **Max Drives** (default), **SD Video**, or **HD Video**.  
For most applications, one of these gamuts produce accurate and realistic colors from a variety of sources.
3. To modify colors based on color temperature, select **Color Temperature**.
4. If the pre-defined settings do not suit your needs, define custom color gamuts.
5. To recover the factory settings, select **Service > Color Primary Settings > Reset to Factory Defaults?**

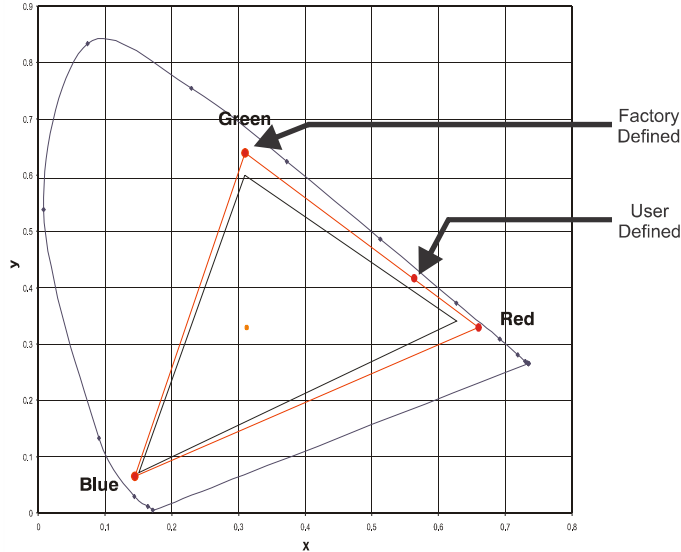
## Defining user color gamuts

If the pre-defined color performance settings do not suit your needs, define custom color gamuts.

For example, you may require a unique color gamut (range) for a single projector or application, or you may need to precisely match colors across multiple adjacent displays.

Changing a color performance or gamut is sometimes known as Comprehensive Color Adjustment™. Enter the known x/y coordinates from the chromaticity graph.

1. In the **Color Adjustments by X,Y** or **Color Saturation** submenu create, alter, or copy a color gamut or color adjustment.  
You can create up to four custom color gamuts (User 1, 2, 3, or 4) with these adjustments. The two menus differ only in their user interface, so use whichever menu best suits your needs and application. A color meter can help with adjustments.
2. Define the precise hue of each primary color component (red, green, blue, and white) used to generate the millions of colors produced in displays.
3. To change the hue of the color, change either the x or y coordinates for each color and relocate the triangle for possible colors.  
Keep new x, y coordinates within the original color gamut triangle.



For example, changing the x/y coordinates for red may move the color closer to orange or closer to violet, which in turn affects all displayed colors having a red component.

4. Adjust the slide bars or enter new specific coordinates as desired to define or change the color gamuts.
5. In the **Advanced Image Settings** menu click **Apply**.

## Adjusting the color saturation

If you do not have specific color coordinates in mind and judge color performance by eye or meter, adjust the color saturation.

A Color Saturation adjustment defines the corresponding x/y coordinates shown in the Color Adjustment by X,Y submenu. These x/y coordinates remain stable for this User gamut until they are changed again through either menu. Values displayed in the Color Saturation menu fluctuate as you use the projector, and is different when you return to this menu in the future. These floating changes do not affect the x/y coordinates or gamut.

1. Select **Advanced Image Settings > Color Adjustment**.  
Each color control defines new x/y coordinates for a color and changes its hue.
2. Adjust color slide bars and judge image color by eye or meter.
3. Adjust the hue of each primary color (red, green, blue, and white) by using more or less of it in relation to the other colors.

## Ensuring brightness uniformity

Use brightness uniformity to create an exceptionally smooth image in which no area appears brighter than another.

Brightness uniformity provides further refinement of displays already matched for their primary colors and overall light output.

When used to refine screens already matched for their primary colors and overall light output, proper adjustment of brightness uniformity can create an exceptionally smooth screen in which:



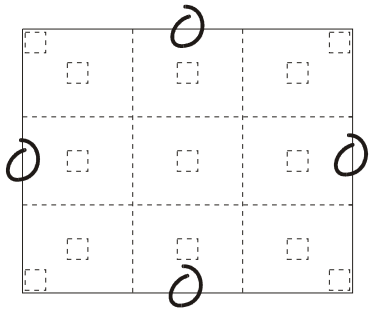
- No area of the screen appears more red, green or blue than another
- No area of the screen appears brighter than another
- Color and light output from one screen closely matches adjacent screens

Before you begin, read through the entire procedure before attempting to adjust Brightness Uniformity controls, and keep in mind the following checklist of prerequisites and guidelines:

- **Adjust Colors First**—Always adjust the primary colors as described in Matching colors across multiple screens on page 74 procedure, before attempting to work with Brightness Uniformity. This ensures that primary colors, color temperature, and maximized light output are all well matched from one screen to another. These matches are needed before you can achieve good brightness uniformity results.
- **Run Lamp For 100 Hours**—Light output and brightness uniformity can vary significantly during the first 100 hours of lamp use. For best results with new lamps, either set up brightness uniformity after this period, or do an initial setup and re-check at 100 hours.
- **Set Lamp Power**—Ensure that each Lamp Power setting is as high as possible for your application while still maintaining a good overall match of light output from screen-to-screen. By nature, achieving a uniform brightness requires a slightly reduced overall brightness—this reduction helps ensure that you have enough range of adjustment when examining brightness variables more closely from screen-to-screen, and helps prevent premature maxing out when trying to match to a certain color, zone, or projector.
- **Use A user Color Temperature**—Always adjust brightness uniformity for a User color temperature defined when you matched primary colors, and continue to use it for all sources displayed on the wall. Your other color temperatures will not necessarily be matched from screen-to-screen.
- **White Uniformity Slide Bars**—White Uniformity slide bar values may not reduce to 0. Each slide bar adjusts overall light output in a specific screen zone, but the value shown represents the current setting for green in this zone. When other hidden values (red or blue) are lower than green, during adjustment in the White Uniformity menu their values reach 0 first, causing the slide bar to stop earlier than expected.
- **Judge By Eye Or Use A Meter**—Good brightness uniformity can be achieved with either.

Although the Brightness Uniformity control can be used for a stand-alone projector, it is particularly useful for setting up and maintaining tiled images that form a cohesive display wall in which the color cast and light output appear uniform throughout each image as well as throughout the entire wall. The procedure provided here assumes a multiple-screen application.

1. To access a multitude of adjustments for light output control in specific areas throughout the image, in the **Brightness Uniformity** menu, select **Brightness Uniformity**.  
The settings apply as long as the **Brightness Uniformity Enable** check box is enabled.  
To disable Brightness Uniformity, clear the Brightness Uniformity Enable checkbox.
2. To apply Brightness Uniformity settings with a large granularity, enable **Coarse Adjustment**.  
Coarse Adjustment helps identify brightness changes and accelerates projector response time while adjusting settings.
3. To ensure matched overall color temperatures and light output between screens, adjust primary colors, double-checking that all whites and light output are well-matched.
4. Select the 13-Point test pattern for display, providing nine screen zones with 13 targets.  
For best results, rather than examining the center of each zone when assessing Brightness Uniformity adjustments focus on extreme edges.



5. In either Color Adjustments menu, select a User color. Then:
  - If you have created a “User 1” color gamut (recommended) for a well-matched wall, continue to Step 6.
  - If you prefer maximum brightness rather than a particular color temperature, select Max Drives. Do not change User 1 Color Adjustment in color-matched applications.
6. In the White Uniformity menu, and set the overall output level to 50.0 and all remaining slide bars to 0.0.
 

This decreases the light output just enough throughout the screen so that any color level can then be increased later as necessary for matching light output from zone-to-zone. Do not exceed 50.0 for Overall—a higher level likely interferes with achieving brightness uniformity and is not recommended.

Ensure that overall light output remains well matched from one screen center to the next. Where necessary, increase or decrease Lamp Power slightly to recover center matches.
7. On each screen, compare the color temperatures in the eight target zones (four edges and four corners) to that of the color temperature of the center.
 

Compare using a white field only, and take note of any areas that do not match the center. Also decide if any screen exhibits a more obvious color shift than other screens.
8. Beginning with the screen that exhibits the most obvious color shift(s), for each edge that exhibits a noticeably different color temperature from the center, select the corresponding **Uniformity** adjustment menu—**Left**, **Right**, **Top**, or **Bottom**.
 

For example, if any part of the left side is too blue, too red or too green, go to the Left Uniformity menu and adjust the colors, for example change their light output, until all portions of the left side closely match the center color temperature. Adjust an edge first (focusing on its center), and then adjust the corners.

Repeat the color adjustment of sides and corners for each edge of the screen that does not yet match the center (note that each corner is adjustable in either of its two adjacent side menus). When done, all areas of a given screen should match.
9. Repeat steps 7 and 8 for all remaining screens.
10. Beginning with the screen exhibiting the most obvious variations in light output, compare the light output of each edge and corner to that of the center. If any of the areas differ, use the **White Uniformity** menu to match edges and corners to the center.
  - a) Adjust edge White Uniformity first.
 

Note that each edge adjustment also affects the rest of the screen slightly. Keep all edges just slightly lower than the center light output rather than matching light output precisely. Otherwise, it may not be possible to brighten the corners (typically the dimmest areas of the screen) enough. The best uniformity is a compromise between the brightest and darkest areas of the screen.
  - b) Adjust corner White Uniformity last.

Each corner adjustment affects only this quadrant.

- c) Repeat for each screen.
11. Repeat steps 7 and 8 and, if necessary, fine-tune the zones so that they all still exhibit a single color temperature.

### Related information

*Matching colors across multiple screens* (on page 31)

## Creating a seamless image with edge blending

To blend overlapping edges together smoothly, use Edge Blending controls to set the precise width, shape and midpoint.

Edge Blending provides a range of controls for smoothing together the overlapping bright edges of multiple adjacent projected images to create a single larger seamless image. These controls, which primarily affect white levels, are typically used in conjunction with mechanical lens blinders (optional), which are installed on the front of the projector and which primarily affect black levels.

Brightness uniformity adjustment, if required, should be performed first. The Edge Blend or Grid Test Pattern are useful for the mechanical setup of the projectors. If necessary, adjust Black Level Blending first with the Black test pattern, then use the White test pattern to blend the white levels on the blend edges. The final step is to check the blended image with an external source. The Edge Blending test pattern has a center line (both horizontal and vertical). The intersection of these lines is the true center of the projector's display area.

In multiple-projector walls, complementary blends between neighboring images can compensate for the extra brightness or intensity where these edges overlap. By controlling blend width and other properties, you can achieve uniformity across the group of images. Visible overlaps disappears, as shown below.

For best results, use the same projector model and type throughout your display wall. In addition, avoid high-gain screens whenever possible—the optical performance of such screens demands minimal image offset, thus projectors must be located very close to one another.

- **Blend Width**—Determines how much area is used for blending along an overlapping edge. Slide bar values represent the number of pixel steps used for the blend. For example, a setting of eight creates a blended edge eight pixels wide.  
A setting of 0 signifies no blending. For best results in most applications, use a blend width greater than 10% of the resolution of the projector (192 on a 1920 x 1080 projector). Larger blend widths can mask uniformity issues between multiple projectors.  
Ranges: (Projector number of columns / 2) horizontal, (projector number of lines / 2) vertical.  
Example: 1920 / 2 = 960 pixels horizontal, 1080 / 2 = 540 pixels vertical.
- **Blend Shape**—Determines the rate of roll-off across the blend width, such as, how quickly the white levels across the blend change from light and dark. Increasing the **Blend Shape** setting accelerates the rate of change at both extremes so that less of the region appears mid-grey (see Figure 3.20). Decreasing the **Blend Shape** setting slows the rate of change so that more of the region appears mid-grey. For most applications, this subtle control is best left close to 50.
- **Blend Midpoint**—Determines the white level at the blend midpoint (the point equidistant between the beginning and end of the blend). Increasing the **Blend Midpoint** setting creates a blend that appears brighter than the rest of the image. Decreasing the **Blend Midpoint** setting creates a blend that is darker than the rest of the image. A setting of 50 means the midpoint is approximately 50% black—for best results in most applications, keep fairly close to this default.

- **Show Blending Overlap**—Turns your defined blend width area to solid grey so that, if needed, overlapping the grey bars can seamlessly align two adjacent images. Toggle the **Show Blending Overlap** off to reactivate the blend effect. Blending Overlap appears as **Reserved** when Christie TWIST is installed.

Christie recommends the projector units be the same models and have identical part numbers. Before attempting to work with edge blending software functions, align the projectors/images by correctly overlapping the displays from your intended external source. Match colors and the brightness uniformity. For a shared edge, all blend procedures and settings should be identical on both projectors.

1. Starting with two projectors, display a full white field test pattern from both.
2. Select **Configuration > Geometry and Color > Edge Blending**.
3. Enable **Edge Blending**.
4. Set starting points for adjustment:
  - a) Set all blend widths to 0.
  - b) Select **More** and set everything in the **Edge Blending** menu to 50.
5. Set blend width on one projector, increase the **Blend Width** for an overlapping edge (for example, if the projector's image is on left, its right edge overlaps the adjacent image—adjust **Right Blend Width**). Use the same setting on the second projector for this shared edge.
6. Re-adjust the width on both projectors until the overly bright band at the midpoint of the overlapping blends disappears or changes to very light grey. For the shared edge, use the same **Blend Width** setting on each projector. If the best blend appears to be between two settings, choose the wider setting for both projectors.
 

In applications where you are projecting only white or light images, the Blend Width may be slightly higher—set according to how much overlap you have between images. Use the following as a guide (examples show overlapping width only—values for overlapping height differs). The recommended overlap is 12.5% - 25%.
7. Check blend if the blended region appears too dark or light in relation to the rest of the image.
  - a) Increase **Blend Midpoint** in both projectors to lighten the overall blend, decrease to darken the overall blend.
  - b) Adjust **Blend Shape** in both projectors to fine-tune change the amount of mid-grey intensity (as opposed to black/white) in the blend.
8. Repeat with remaining projectors with overlaps.
9. Check completed display wall with the desired external signal.
10. If necessary, adjust the mechanical alignment to maintain perfect pixel-on-pixel alignment over time.

## Adjusting the intensity of black

Eliminate the differences between black levels when edge blending multiple projectors.

The **Black Level Blending** submenu provides many controls to allow the edges of adjacent images to be smoothly overlapped creating a seamless image. Adjust white levels before adjusting black levels. Blinders are recommended for fixed installations.

Similar to **Edge Blending**, **Black Level Blending** allows you to adjust the black level intensity of multiple adjacent projected images to create one large seamless display.

Adjust white levels before adjusting black levels. The zones in the Black Level Blending (BLB) menu correspond to the edge blend zones.

1. Starting with two projectors, in the **Geometry and Color** submenu, select the black test pattern for both projectors from.  
The menu options vary depending on the edge blending parameters. When adjusting six or more projectors, you need to ensure that the brightness of each target area is matched as closely as possible.
2. In the **Black Level Blending** submenu, enable black blending by selecting **Standard** from the pull-down list for each projector.
3. Working with one projector at a time, use the center brightness slide bar to adjust the center brightness (brightness of the non-blended region) so that the center intensity matches that of the brightest blended region (the center of all images when blending a 2 x 2 display is the target area).
4. Choose which of the next four options, Top, Bottom, Left, Right, to use depending on which edge of the projector you are working with has been edge blended.  
The blend width can be adjusted to line up properly but by default it corresponds to the edge blending setting determined for that edge.
5. Adjust the brightness and black hues of the blended region in more detail in case fine-tuning is needed.  
This may be only necessary for blending a 2 x 2 projector display because of blending differs for the sides and center.

## Uploading a gamma file

Upload the gamma settings file to the projector for accommodating the ambient conditions.

1. Click **Admin > System**.
2. Click **Upload Browse** and locate and select the file on a Network drive location or from your hard drive.
3. Select **Gamma** as the file type.  
If you select a Gamma file type, it must be a .csv file with 1024 values (all colors same) or 1024 x 3 for individual colors to enable the **Gamma Properties** section.
4. To display the Gamma Upload window, click **Upload**.
5. Enter a descriptive name in the **Display Name** field.
6. To confirm the upload, click **Yes**.

# Monitoring and maintaining the projector

Installers, service trained operators, and all other users must maintain a safe operating environment at all times. Read through this section in its entirety and understand all warnings and precautions before attempting to operate this projector.

## Backing up the configuration and preferences

You can back up the current projector settings in case you must restore these settings at a later time.

1. Click **Admin > System**.
2. Select a file type (All, Preferences, Configuration, Channels, or Users) from the **Backup** list.
3. To initiate the download click **Backup**.  
A backup in progress bar appears. Once finished, a file download window appears.
4. Click **Save**.
5. Locate and select a folder within your Network drive or hard-drive where you wish to save the file.
6. Click **Save**.

## Restoring a backup file

Use the following instructions when importing and restoring the projector's settings from the saved backup file.

1. Click **Admin > System**.
2. Click **Browse**.
3. Locate and select the file to restore.
4. Select the type of file to restore (All, Preferences, Configuration, Channels, Users or Real Time Events (RTE)).  
Do not select All unless transferring all files from one projector to another or cloning.
5. Click **Restore**.  
A Restore in Progress bar appears. Once finished, a confirmation message appears.

## Performing a diagnostic test using interrogator

Run the interrogator to identify and correct projector faults.

1. Click **Admin > System**.
2. To initiate the diagnostic test and download the diagnostic test results to your computer, click **Interrogate**.  
A Interrogator in Progress bar appears. Once the download is complete, a File Download window appears.
3. Click **Save**.  
The results can be saved to a Network drive or local hard-drive.

## Monitoring the projector status

The read-only Status menu lists a variety of details about the standard and optional components currently detected in the projector.

Refer to the Status menu for versions of hardware and software installed, the type (size) of lamp, the hours logged in total and for a specific period (such as a rental period), and for your projector model name and serial number. In addition, the Status menu identifies the current channel, its location, its frequencies and other details.

## Alarm conditions

An alarm condition consists of a message that is on the LCD display located beside the built-in keypad.

There are two types of alarm conditions:

- Warning alarm—Appears when an error or a non-optimal condition has occurred, and generally does not prevent the projector from operating. An example is when a temperature is slightly elevated.
- Critical Alarm—Appears when a condition occurs that could prevent the projector from operating and could cause damage to the projector. This may cause the projector to shut down automatically. An example would be a fan not running.

Both alarm types display:

- The item of alarm
- The status of the item

The item of the alarm can be either physical (fan or sensor), or the alarm can be a software issue (lamp driver). The LCD displays the status of the item and its units. If the status of the item is out of normal range an alarm is created. When the status of the item is within normal range the alarm clears.

When an alarm is displayed in the LCD display, the built-in keypad is disabled. To confirm the alarm, press the OK soft key to enable the built-in keypad. The alarm condition can also be viewed in the read-only Status menu using the remote.

## Configuring SNMP

The M Series SNMP (Simple Network Management Protocol) interface provides network administrators with a common way to manage their network devices from a single remote location.

SNMP allows an administrator to query a number of devices to see their current status and configuration. It also allows operators to change configuration values and configure trap notifications to be sent when certain events occur.

1. Select **Configuration > Communications > SNMP**
2. Request the current state of the following controls.
  - Power
  - Main
  - Input
  - Channel
  - Lamp Life
  - Shutter
  - Host Name
  - IP Address
3. Request these status items directly.
  - Main software version
  - Global alarm status
  - Lamp 1 life (just Lamp Life is displayed if there is no second lamp)
  - Lamp 2 life (if applicable)
  - Lamp 1 status (just Lamp Life is displayed if there is no second lamp)
  - Lamp 2 status (if applicable)
4. Configure the SNMP traps.

A trap is a condition that SNMP monitors on the projector. When the condition is met, a notification is sent by an SNMP notification or email message. Each traps condition can be set to **Disabled, SNMP Trap, Email** or **SNMP Trap + Email**. The traps are defined in a series of MIB files hosted directly on the projector. MIB files can be accessed from a web browser window, using the address `//<IP Address>/mibs/`.

Operators are able to select from the following trap events to receive up to three SNMP traps and three email notifications when they occur:

Event	Message (Email Notification)	Parameters	Trap Config. Menu Text	Default Notification Setting
Lamp end of life	Lamp has reached end of life	Lamp Number Lamp Hours Elapsed	Lamp Life	SNMP Trap + Email
Lamp end of life cleared	Lamp end of life cleared	Lamp Number		
Lamp fault	Lamp fault has occurred	Lamp Number Lamp Fault	Lamp Fault	



Event	Message (Email Notification)	Parameters	Trap Config. Menu Text	Default Notification Setting
		Description		
Lamp fault cleared	Lamp fault has been cleared	Lamp Number		
Fan stall	Fan stalled	Fan Name	Fan Stall	
Fan no longer stalled	Fan stall cleared			
Thermal sensor warning	Thermal sensor warning	Thermal Sensor Name	Thermal Sensors	
Thermal sensor error	Thermal sensor error	Thermal Sensor Text		
Thermal sensor OK	Thermal sensor OK			
Projector powered on (Standby to Lamps On)	Projector turned on (lamps on)	None	Power	Disabled
Projector powered off (Lamps On to Standby)	Projector turned off (lamps off)			
No video input signal	No video input signal	Frequency	Signal Lost/ Detected	
Video input signal detected	Video input signal detected			
Lamp door open	Lamp door has been opened	Lamp Number	Lamp Door	
Lamp door closed	Lamp door has been closed			

5. Configure the **Email notification**.

When a trap occurs while email notification is selected for the event, an individual email is sent to each user defined email recipient. The SNMP menu allows up to three email address (up to 64 characters in length) to request notifications from the system during a trap event.

The resulting email is in the following format:

```
From: <from@email.com>
To: <to@email.com>
Subject: Christie M Series Projector SNMP Notification
```

```
Message:
Projector Name: <projector name>
Location: <SNMP location>
IP Address: <IP address>
Description: <message>
Parameters: <param 1> = <param 1 value>; <param 2 > = <param 2 value>; ...
```

## Adding a scheduled event

Scheduled events include a command or sequence of commands.

1. Select **Advanced** > **RTE** and click **Add**.
2. Select the **Scheduled Event** tab.  
The scheduled tab is always selected by default on add.
3. Select the frequency option for the event by selecting either **Once**, **Daily**, **Weekly**, or **Monthly**.  
End Date is enabled when Daily, Weekly or Monthly repeat options are selected.
4. To open a calendar pop-up window, click within the **Start Time** field.
5. Navigate to and choose a desired date.  
The selected date populates the Start Time field.
6. In the field below the Start Time field, enter a start time in the format hr:min:sec.  
The default is the current time.
7. To set the computer and projector time to be the same, click **Sync**; otherwise, the event runs based on the projector time.
8. Enter a description of the scheduled event, with a maximum of 100 characters.
9. In the **Command String** box, enter a serial command or a sequence of serial commands for the projector to perform.
  - If a **GPIO** command string is needed, click the **GPIO Output Helper** button for instructions on how to create the command structure.  
The Output field contains seven blocks which refer to the seven I/O pins on the GPIO connector. Pin 1 = +12V and Pin 5 = Ground. These are not included. Clicking a block toggles between H, L, and X. If the Pulse check box is selected, those I/O Pins defined pulse high or low. The Serial Representation box is read only.
  - For a description of special RTE commands available for adding loops and delays to the command sequence click the **Help** button.
  - To test the entered command string, click the **Test** button.  
If the test passed or failed, a green or red icon appears to the right side of the Test button.
10. Click **Finish**.  
The added event appears in the RTE Listing window.
11. To activate or deactivate one or more RTEs, select or clear each check box in the Active column accordingly.

## Adding a system event

Run a command when the specified system event is triggered.

1. Select **Advanced** > **RTE** and click **Add**.
2. Select the **System Event** tab.
3. Select a type of **System Event**.

## Adding a GPIO event

Run a command when the specified GPIO input is received.

1. Select **Advanced > RTE** and click **Add**.
2. Switch to the **GPIO Event** tab.
3. Define the **Input Condition** field as required for the **GPIO Event**.  
The **Input Condition** field contains seven blocks, which refer to the seven I/O pins on the GPIO connector. Pin 1 = +12V and Pin 5 = Ground are not included or changed. Clicking a block toggles between H, L and X.

## Adding a function key event

Run a serial command when the function key is pressed.

1. Select **Advanced > RTE** and click **Add**.
2. Select the **Function Key Event** tab.
3. Select a function from the list.

## LED and key states

The LED color of the keys indicates that the key is in one of these states

LED color	Status
Amber	A functionality is available that affects the displayed image of the projector.
Blue	A functionality is available that is relevant to the built-in LCD only and will not affect the displayed image from the projector.
Off	The key is disabled in the current context.
Power key	Used to switch from Standby mode to ON, and from ON to Standby mode; LED always remains Amber
Help key	Only available in the on-screen display (OSD) context; LED is Amber when the menu is being displayed on the projected image display. When no menu is being displayed, the Help key is still enabled if the OSD is enabled. It is only disabled when the entire OSD is set to OFF.
Auto key	Enabled state when the power is ON, and there are no test patterns on the screen. If the power is OFF or a test pattern displays, the Auto key is disabled.
Exit key	Is determined in the specific context of the screen being displayed.
Input key	Enabled when the power is ON. Disabled if the power is OFF.
Lens key	Enabled when the power is ON. Disabled if the power is OFF.
Shutter key	Enabled when the power is ON. Disabled if the power is OFF.
Menu key	Always remains in the enabled state when the power is ON. If the power is off the Menu key is disabled.
Soft key	Used to select an action indicated by text above the key on the LCD. If no text is shown, the associated key is disabled.

## Projector status LEDs

Identify the input LED state colors and meaning.

Looking from the back of the projector, the LEDs represent, from left to right; Lamp 1, Lamp 2, Power, and Status. The LEDs display the colors as shown below.

Projector state	LEDs	LED state
Hard boot	All	All LEDs amber—Please wait
Standby mode	Lamps 1 and 2	<b>Off</b> —Lamps are off
	Power	<b>Amber</b> —AC is present but projector is off or standby
	Shutter	<b>Green</b> —Shutter is open
<b>Amber</b> —Shutter is closed		
Warm-up (Powering on from standby)	All	LEDs cycle green from left to right
Normal operation	Lamps 1 and 2	<b>Amber</b> —Lamp time has expired and lamp should be replace
	Power	<b>Green</b> —Projector is powered up and operating normally
	Shutter	<b>Green</b> —Shutter is open
<b>Amber</b> —Shutter is closed		
Cool-down	All	LEDs cycle from left to right
Error	Lamp 1 and 2	<b>Amber</b> —Lamp time has expired and lamp should be replace
		<b>Flashing red</b> —Lamp time has expired and lamp should be replace
	Power	<b>Flashing red</b> —Error has occurred. Details are displayed on the status display.
Software upgrade in progress	All	The pattern will alternate between Amber and Off
Lamp Regeneration in progress	Lamp 1 and 2	<b>Flashing Green</b> —The lamp is being switched off for its regeneration period to extend lamp life (typically 15 minutes every 24 hours)
	Power	<b>Green</b> —On
		<b>Amber</b> —Standby
	Shutter	<b>Green</b> —Shutter is open

A condition occurs on the first power on after a software upgrade, and is indicated by all the following:

- The Status LEDs are cycling green
- The LCD displays the warning *Image Processor Upgrading*
- The LED on the image processor card flashes green
- The web page shows a warning that the image processor card is upgrading
- When this occurs, the projector should not be AC power cycled and the image processor card should not be removed

## Maintaining the cooling system

The high-intensity lamps and electronics rely on a properly functioning cooling system. Regular maintenance of the cooling system is critical to prevent overheating and sudden projector failure and helps ensure reliable operation.



**Caution!** If not avoided, the following could result in minor or moderate injury.

- Do not remove or disable the vane switch.
- Do not attempt to operate the product with inadequate airflow which can result in dangerous overheating.
- Keep fingers and other body parts away from the moving parts in the product. Tie back long hair, and remove jewelry and loose clothing before manually adjusting the product.



**Notice.** If not avoided, the following could result in property damage.

- Use only high efficiency Christie approved filters.
- Do not reuse an old air filter.
- Do not operate the product without the filter installed.

## Ventilation

Vents and louvers in the projector covers provide ventilation, both for intake and exhaust.

Never block or cover these openings. Do not install the projector near a radiator or heat register, or within an enclosure. To ensure adequate airflow around the projector, with a minimum clearance of 25cm (10") on the left, right and rear sides of the projector from any walls or other obstructions.

## Replacing the dust air filter

Complete this procedure to replace the dust air filter.

Check projector air dust filters, at minimum, every month.

Dust air filters must be replaced whenever the lamp is replaced or between 200-500 hours, depending on use. A clogged air filter reduces air flow and can lead to overheating and failure of the projector. Check monthly by inspecting its color through the side vent grille with a flashlight. Replace grey colored filters.

Leave the filters in their sealed packaging until ready for use.

1. Unscrew the two captive screws at the top of each filter door. Allow the door to rest down and away from the projector.



2. Slide the air filter out and replace, vacuum or wash the filter. Wash using mild soap and water. Dry the filter before using.
3. Insert the new or clean air filter.

4. Secure the filter door by tightening the two captive screws loosened in step 1.

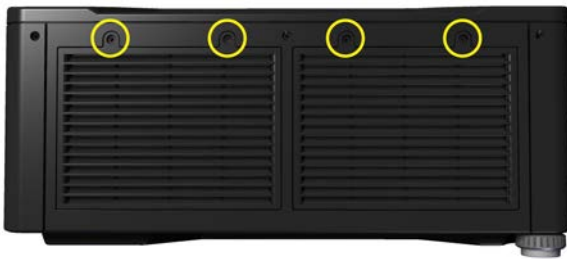
## Replacing the fog oil filter

Complete the following procedure to replace the fog oil filter.

Fog filters should be replaced after each use of the projector to a maximum of 20 hours. The life of the filter is approximately 20 hours based on environmental conditions. Leave the filters in their sealed packaging until ready for use.

The fog filters cannot be re-used or they clog up with oil and the projector overheats and shuts down. Each filter is a two-stage filter; the black activated charcoal layer faces out, and the white layer faces the projector.

1. Loosen the two captive screws at the top of each filter door.



2. Slide the filter out.
3. Insert the new filter with the white layer facing into the projector and the black layer facing out.
4. Secure the filter door by tightening the two captive screws loosened in step 1.

## Maintaining the optics

Inspect and clean optical components such as the projection lens or reflector to ensure optimum image display.

## Viewing the lamp history

Monitor the states of the lamps and the number of hours used.

To display the serial number and the number of hours logged for each lamp (currently and previously) installed in the projector, select **Lamp > Lamp 1 History** or **Lamp > Lamp 2 History**.

The top-most entry is always the most recent/current lamp.

## Notifying users after a set number of hours of lamp use

When the lamp has been used for a specified number hours, display a message.

1. Select **Lamp > Warn when lamp reaches (hours)**.
2. Set the number of hours.

When set, the projector displays a warning message when the lamp has a recorded ON time that exceeds the specified number of hours. The warning is displayed on the status page for each lamp, where applicable.

This setting is user-defined only. It has no bearing on lamp warranty and is not tied to actual lamp life in any way.

3. To disable the notification, set the number of hours to 0.

## Replacing the lamps

Follow these steps to install a new lamp in the projector.



**Caution!** If not avoided, the following could result in minor or moderate injury.

- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.
- EXPLOSION HAZARD! Allow sufficient time for the lamp to cool down before powering down the product, disconnecting it from AC, and opening the lamp door.
- Dispose of bare bulb with packaging according to local area regulations.
- EXPLOSION HAZARD! Do not stress the glass of a lamp or bare bulb in any way.
- UV EXPOSURE! Protective UV safety glasses with side shields and Christie approved protective safety clothing must be worn when performing optical adjustments or servicing the product.

## Removing the lamps

The projector runs dual 200W, 350W, or 450W mercury lamps. Two lamps are located on the opposite side of the projector from the intake air filters.



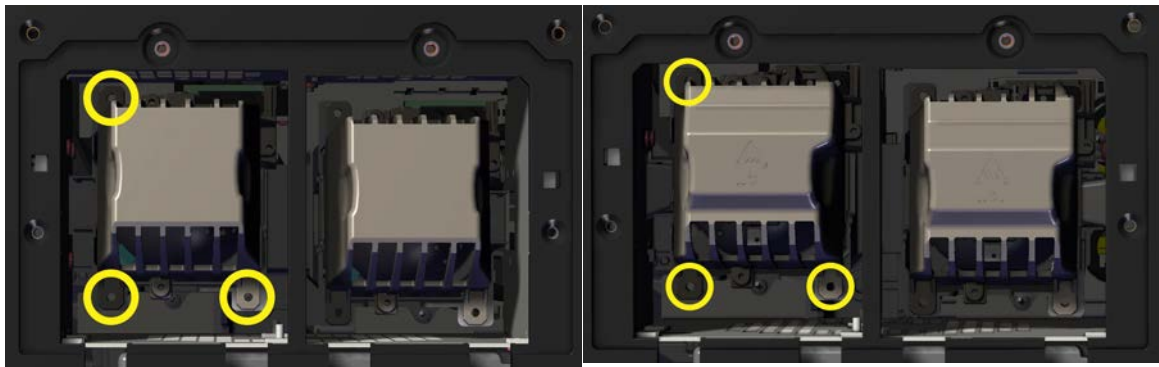
**Warning!** If not avoided, the following could result in death or serious injury.

- UV EXPOSURE! Protective UV safety glasses with side shields and Christie approved protective safety clothing must be worn when performing optical adjustments or servicing the product.
- EXPLOSION HAZARD! Allow sufficient time for the lamp to cool down before powering down the product, disconnecting it from AC, and opening the lamp door.

1. Open the lamp doors by unscrewing the captive screw.



2. Unscrew the three captive screws securing each lamp.



200W and 350W

450W

3. Slowly slide the lamp out of the compartment.
4. For the second lamp, repeat steps 1 to 3.
5. Check the aluminum tape on the lamp door. If there are any signs of adherence degradation, replace the tape.

## Installing the lamps

If replacing lamps due to a lamp explosion; both lamps should be removed from the lamp housing area, including fan #4 and exhaust ducts. Ensure they are carefully vacuumed before lamp replacement.



**Warning!** If not avoided, the following could result in death or serious injury.

- UV EXPOSURE! Protective UV safety glasses with side shields and Christie approved protective safety clothing must be worn when performing optical adjustments or servicing the product.
1. Carefully insert the lamp into the lamp housing with the connector oriented to the top.
  2. Seat the lamp onto the mating connector in the projector and push the lamp forward until fully seated.
  3. Secure the lamp with the three captive screws.
  4. Close and secure the lamp door.

## Disposing of the lamp

The lamp is extremely hazardous. Do not dispose of in regular trash.

For warranty claims:

1. Carefully repack the lamp with the original shipping material and carton.
2. Enclose the completed RMA claim form that came with the lamp.
3. Ship the lamp to the nearest Christie service depot for evaluation.

For safe disposal:

1. Pack the lamp into its original carton (without the packaging material).
2. Tape the box up securely along its seams.
3. Discard as industrial waste, in accordance with your local regulations.



## Changing the lamp serial number

Change the serial number for the current lamp.

The new serial number is applied to the current lamp statistics file. It does not archive the current statistics as done by the Change Lamp function.

1. Select **Lamp > Lamp 1 s/n** or **Lamp > Lamp 2 s/n**.
2. Enter the new serial number.

## Cleaning the projector optics

Learn about cleaning the optical components in the projectors.

Unnecessary cleaning of optics, increases the risk of degrading delicate coatings and surfaces. Only clean optics when dust, dirt, oil, fingerprints or other marks are obvious and are causing performance problems. Maintenance of optical components requires a qualified service technician. Inspect exposed optical surfaces periodically in a clean, dust-free environment using a flashlight.

Never touch an optical surface with your bare hands. Always wear latex lab gloves.

Use the following products when cleaning the optical surfaces:

- Soft camel-hair brush
- Dust-free blower—filtered dry nitrogen blown through an anti-static nozzle.
- Dust-free lens tissue, such as Melles Griot Kodak tissues (18LAB020), Opto-wipes (18LAB022), Kim Wipes or equivalent
- Cotton swabs with wooden stems only
- Lens cleaning cloth/microfibre, such as Melles Griot (18LAB024) or equivalent

## Cleaning the lens

To avoid the risk of scratching the lens, clean the lens only if absolutely required.

### Removing dust from the projection lens

Remove dust from the projection lens to ensure optimum image display.

1. Brush most of the dust off with a camel-hair brush or use a dust-free blower.
2. Fold a microfiber cloth and wipe the remaining dust particles off the lens with the smooth portion of the cloth that has no folds or creases.  
Do not apply finger pressure. Instead, use the tension in the folded cloth to remove the dust.
3. If significant dust remains on the lens surface, dampen a clean microfiber cloth with lens cleaning solution and wipe gently until clean.

### Removing fingerprints, smudge, or oil from the projection lens

Remove fingerprints, smudges, or oil from the projection lens to ensure optimum image display.

Clean the lens only if absolutely required.

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.
2. Wrap a lens tissue around a swab and soak it in lens cleaning solution.  
The tissue should be damp but not dripping. Do not use a cleaning solvent that contains ammonia. Avoid lens contact with Xylene and Ether.

3. Gently wipe the surface using a figure eight motion.
4. Repeat until the blemish is removed.

# Troubleshooting

## Projector does not power on

When I attempt to power on the projector, it does not turn on.

### Resolution

1. Ensure projector is plugged in.  
Check power switch above power cord is in the ON position.
2. Check that the Status LEDs are ON.  
While the projector is busy initializing, the LEDs should be cycling. When finished initializing, the Power and Shutter LEDs (the two on the right) should be on.
3. Check the LCD display.  
While the projector is busy initializing, the display should show "Please wait". When finished initializing, the display should show "Standby mode".
4. Check the LCD display for any warnings or errors.  
A condition occurs on the first power on after a software upgrade, and is indicated by all the following:
  - The Status LEDs are cycling green
  - The LCD displays the warning "Image Processor Upgrading"
  - The LED on the Image Processor card flashes green
  - The Web page shows a warning that the Image processor card is upgrading.When this occurs, the projector should not be AC power cycled and the Image Processor card should not be removed. This operation may take as long as five minutes to complete.

## Lamp does not ignite

The projector is powered on but the lamp does not ignite.

### Resolution

1. Check for an interlock failure.  
Check the LCD display for an error. If the other lamp has ignited and an image can be seen, use the remote keypad and check the Status menu for any errors and for the Lamp door interlock status. If not lamp has ignited, use the Virtual OSD on the web interface to check these items. The interlock failure could be an open lamp door or a failed lamp fan.

2. Using the remote keypad or Virtual OSD as above, check the lamp mode in the Lamp menu. This may be set to a single lamp or dual lamp mode. Check in the Status menu what the reported mode is.
3. For suspected communication failures, power-down the projector and try again.
4. If the lamp does not ignite after the second attempt and after powering down and up again (complete AC power down, then replace the lamp).

## Lamp suddenly turns off

The lamp unexpectedly turned off.

### Resolution

1. Check lamp power through the remote keypad checking the **Lamp** menu or from the web user interface **Advanced: Lamp** menu. Try increasing lamp power.
2. Check for an alarm condition on the LCD keypad display.
3. Replace the lamp.

## Flicker, shadows, or dimness

The lamp light flickers, has shadows, or has dimness when the lamp is lit.

### Resolution

1. Check lamp power through the remote keypad checking the Lamp menu or from the web user interface **Advanced: Lamp** menu. Try increasing lamp power.
2. Replace the lamp.

## Black LCD screen, no menu displays

The backlight on the LCD and the backlight on the built in keypad are blank.

### Resolution

1. Press any arrow key on the built-in keypad. The backlight on the LCD and the backlight for the built-in keypad should turn on.
2. If the LCD is still blank, restart the projector.

## Remote keypad does not seem to work

I get no response when I try to use the remote keypad.

### Resolution

1. Replace the batteries.
2. Check if IR signals are received by the projector. Pressing any key on the remote control towards the front or rear sensor, the Status LED blinks, regardless if any command is executed. If the LED does not blink, restart the projector.
3. Ensure the remote keypad is enabled. If the projector is powered, using the built-in keypad, open the OSD menu and select **Main Menu > Configuration > Communication**. Ensure **Front IR Enabled** and **Rear IR Enabled** are enabled. Enable them if they were disabled and try again.
4. Projector is busy. If the projector is busy in a warm-up mode or in a cool-down mode, the commands from the remote keypad may be ignored. Wait until the projector reaches a stable state (Power ON or Stand By) and try again.
5. Press the **PROJ** key on the remote keypad. If this brings up a pop-up box on the OSD, ensure that the check box is marked to enable the projector.
6. Using the **XLR** connector, use the remote as a wired keypad. If it does work and all the IR sensors have been enabled, then there may be a problem with the IR sensors.

## The on-screen display menu does not display

The on-screen display (OSD) menu does not display on the LCD screen.

### Resolution

- Using the LCD, ensure that OSD menu is enabled, scroll-down until the item OSD appears. The LCD shows "OSD: off". Press and hold the OSD soft key on the built-in keypad. The LCD now shows "OSD on" then press the menu key on the remote keypad.  
or  
Press and hold the OSD key on the remote keypad for 2-3 seconds, then press the menu key.

## Cannot establish communication with projector

The input devices cannot communicate with the projector.

### Resolution

1. Ensure any address changes have been saved, and reboot to implement. If you still have trouble establishing communications with a projector added to an existing Ethernet network, the projector IP address is likely in conflict with another address already in use. Contact your network administrator.
2. Ensure Ethernet settings are valid for the site. All devices should have the same subnet mask yet unique IP addresses.

## The projector is on, but there is no display

The projector is on, but content does not display.

### Resolution

1. Was a lens cover accidentally left on? Remove lens cover.
2. On the LCD display, check that the shutter is open. This is also indicated by the shutter LED being green.
3. Is the correct input selected? Check cable connections.
4. Check if menus appear on the screen.
5. Can you access test pattern? Ensure a full black test pattern has not been selected for display, press Menu to access test patterns, then cycle patterns with keys. Check your source connections again.

## Severe motion artifacts

The displayed image has artifacts such as smearing and double image perception.

### Resolution

- Most likely there is a synchronization problem with reversed 3-2 pull-down in 60Hz-to-24Hz film-to-digital conversion in your source. Correct at the source.
- Set the projector to run in Free run. Open OSD menu and go to Input Switching and PIP. Ensure that running mode is set to Free Run not to Frame Lock.
- Display a test pattern on the screen, pressing the Test button on the remote keypad. The test pattern should be displayed correctly. If not, contact your dealer for assistance.

## Image is vertically stretched or squeezed

The image appears vertically stretched or squeezed into the center of the screen.

### Resolution

1. Run auto setup, pressing Auto button on the remote keypad.
2. Check your resizing selection.

## Display is jittery or unstable

The video does not display smoothly.

### Resolution

- If the display is jittery or blinking erratically, ensure that the source is properly connected and of adequate quality for detection. With poor quality or improperly connected source, the projector repeatedly attempts to display an image, however briefly.
- The horizontal and vertical scan frequency of the input signal may be out of range for the projector.
- The sync signal may be inadequate. Correct the problem at the source.

## Display is faint

The displayed image appears faint.

### Resolution

- Brightness and/or contrast and/or gamma may be set incorrectly.
- The source may be double terminated. Ensure the source is terminated only once.
- The source (if non-video) may need a different sync tip clamp location.

## The upper portion of the display is waving, tearing, or jittering

The upper portion of the video does not display smoothly.

### Resolution

- This can occur with video or VCR sources. Check your source.

## Portions of the display are cut off or warped to the opposite edge

Not all of the image is displayed, or is warped.

### Resolution

- Resizing may need adjustment. Adjust until entire image is visible and centered.

## Display appears compressed or vertically stretched

The display appears vertically stretched or compressed.

### Resolution

1. The frequency of the pixel sampling clock is incorrect for the current source.
2. Sizing and positioning options may be adjusted poorly for the incoming source signal.
3. Use an anamorphic lens for typical HDTV and anamorphic DVD sources that have been re-sized and vertically stretched, through 3rd-party software.

## Data is cropped from the edges

Parts of the image are missing at the edges of the display.

### Resolution

- To display the missing material, reduce image size to fill the display area available in the projector, then stretch vertically to fill the screen from top to bottom.
- Add the anamorphic lens to regain image width.

## Display quality appears to drift from good to bad, bad to good

The quality of the input is inconsistent.

### Resolution

- The source input signal may be of low quality.
- The horizontal or vertical frequency of the input may have changed at the source end.

## Display suddenly freezes

The image stops playing, and freezes.

### Resolution

If the screen blacks out inexplicably, it is possible that excessive voltage noise on the AC or ground input has interrupted the projector's ability to lock on to a signal.

- Power down the projector and disconnect from AC.
- Then plug in again and power up as usual.



## Inaccurate display colors

The colors in the image are not what I expected to see.

### Resolution

- The color, tint, color space and/or color temperature settings may require adjustment at your input source.
- Try **Auto Setup**.
- Ensure signal connections are correct.
- Ensure the proper channel for this source is being used.

## Display is not rectangular

The shape of the display is not correct.

### Resolution

- Check leveling of the projector. Ensure the lens surface and screen are parallel to one another.
- Is the vertical offset correct? Make the necessary adjustments to the vertical offset on the lens mount.

## Display is noisy

The projected image contains noise.

### Resolution

- Display adjustment at the input source may be required. Adjust pixel tracking, phase and filter. Noise is particularly common on YPbPr signals from a DVD player.
- Ensure the video input is terminated (75 ohms). If it is the last connection in a loop-through chain, the video input should be terminated at the last source input only.
- The input signal and/or signal cables carrying the input signal may be of poor quality.
- If the distance between the input source device and the projector is greater than 25 feet, signal amplification/conditioning may be required.
- If the source is a VCR or off-air broadcast, detail may be set too high.

## After a projector software upgrade, the Web UI does not display correctly

### Resolution

1. After an upgrade, the temporary internet files and cookies must be cleared from the web browser to ensure that Web UI changes can take effect.
2. Delete the browser cookies.  
For instructions on deleting cookies, refer to the browser help.
3. Close the browser and re-open before connecting to the projector.

## A backup or interrogator file cannot be saved

My interrogator backup file cannot be saved.

### Resolution

After performing a backup of Interrogator, you may be prompted from a pop-up window before saving the file. If you have not specifically set your browser to automatically open/save the file without prompting, and if pop-up windows have been disabled (by enabling the pop-up blocker), then you cannot save the file.

1. Set your browser to automatically save files.
2. Enable pop-ups for the WebUI.

# Appendix A: DMX/ArtNET

DMX is a standard for digital communication networks that are commonly used to control stage lighting and effects.

A real time event is a pre-recorded sequence of one or more serial commands which are executed when a defined trigger occurs. For example:

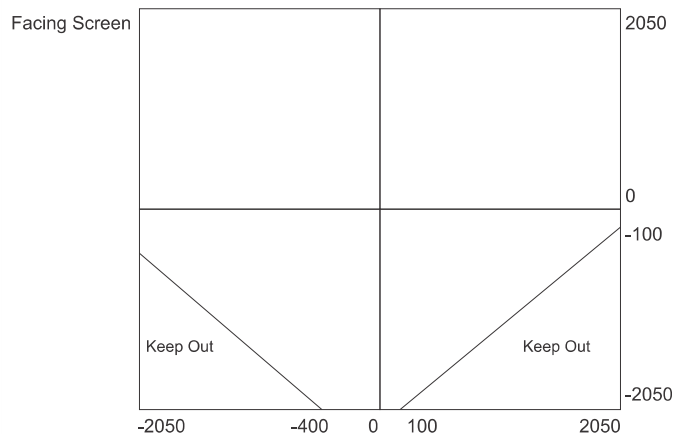
- A trigger can be timed based (i.e. Saturday at 1:00pm; occurring every other week)
- A trigger can be event based (i.e. System powers on, good signal, etc.)
- A trigger can be a number of other events

Areal time event can use nested loops and delays. Only statically defined commands can be executed, for example `PWR 0, SHU 1`. You cannot use variables or other complex programming techniques.

## Lens control limitations

Normal ILS control of the lens horizontal and vertical positions by the projector respects the boundaries of the lens keep out area.

This area is necessary to prevent damage to components within the projector. When the DMX controls are used to set the absolute position of the lens, setting values in these keep out areas may result in an unwanted final lens position. You must ensure that any interim or final lens positions, at any time during the lens movement, do not enter the keep out area.



## DMX channel setup

Each personality has a different number of channels:

- **Setup Personality**—38 channels

- **Show Personality**—18 channels
- **Nitro VIP Projector Yoke Personality**—25 channels

You must properly configure the base channel (depending on which personality is used) correctly. While the DMX specification allows for device overlapping, this may cause unwanted results. Below is a table of how projectors should be configured (assuming that all projectors are to be controlled independently and use the same personality):

**Show personality (Correct)**

Base channel	All projectors using Show Personality (Correct)
1	Projector 1 (18 ch)
19	Projector 2 (18 ch)
37	Projector 3 (18 ch)

**Setup personality (Correct)**

Base channel	All projectors using Show Personality (Correct)
1	Projector 1 (38 ch)
39	Projector 2 (38 ch)
77	Projector 3 (38 ch)

**Show personality (Incorrect)**

Base channel	All projectors using Show Personality (Correct)
1	Projector 1 (18 ch)
1	Projector 2 (18 ch)
12	Projector 3 (18 ch)

## M Series setup personality

Learn the channels and descriptions for this personality.

Channel	Group	Name	Description	Default Value	Notes
1	Safety	Slider Lock	0-171 Locked 172-255 Unlocked	255	No Channel changes are applied when this control is locked. Channel changes made while the slider is locked are applied once the slider becomes unlocked.
2	Video	Fade to/from Black	0-85 Black screen (Picture mute ON) 172-255 Live Video (Picture mute OFF)	255	To manually control the fade to black time, the brightness channel can be used to achieve the same effect.
3	Lens	Shutter	0-85 Shutter Closed (Black Screen)	255	

Channel	Group	Name	Description	Default Value	Notes
			172-255 Shutter Open (Live Video)		
4	Lens	Lens shift enable	0-85 Lens shift disable 172-255 Lens shift enable	255	Locks all lens motors.
5	Lens	Zoom (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	125	Locked by channel "Lens shift enable"
6	Lens	Zoom (Fine)		0	
7	Lens	Zoom (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	128	Locked by channel "Lens shift enable"
8	Lens	Zoom (Fine)		0	
9	Lens	Lens Horizontal position (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 4096	128	Locked by channel "Lens shift enable"
10	Lens	Lens Horizontal position (Fine)		0	
11	Lens	Lens Vertical position (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 4096	128	Locked by channel "Lens shift enable"
12	Lens	Lens Vertical position (Fine)		0	
13	Input	Channel	Projector Channel Selection 0 to 9 Projector Channel 1 10 to 19 Projector Channel 2 20 to 29 Projector Channel 3 — 180 to 189 Projector Channel 19 190 to 199 Projector Channel 20	255	
14	Input	Input	Input Selection 0 to 9 Slot 1, Input 1 10 to 19 Slot 1, Input 2 — 50 to 59 Slot 1, Input 6 60 to 69 Slot 2, Input 1 — 110 to 119 Slot 2, Input 6	255	Does not change input on default

Channel	Group	Name	Description	Default Value	Notes
			120 to 129 Slot 3, Input 1 — 170 to 179 Slot 3, Input 6 180 to 189 Slot 4, Input 1 — 230 to 239 Slot 4, Input 6		
15	Image	Image Freeze	0-85 Unfreeze image 172-255 Freeze Image	0	
16	Lamps/ Power	Power	0-85 Power Off (Switch lamps off, cool lamps down and go to Standby mode) 172-255 Power On (Switch lamps on, warm up mode)	128	A five second timer is used before executing a power state change. If the slider moves out of the On/Off range within the five seconds, the timer is cancelled. Does not change power stat on default.
17	Image	Size	0 to 255 Scaled as % of total control range, which is 200 to 4000	67	
18	Image	Vertical Stretch	0 to 255 Scaled as % of total control range, which is 200 to 3000	91	
19	Setup Functions	Projector Orientation	0-49 Front Projection 50-99 Rear Projection 100-149 Front Projection Inverted 150-199 Rear Projection Inverted	255	Does not change projector orientation on default.
20	Setup Functions	On Screen Display	0-85 OSD Off 172-255 OSD On	128	Does not change OSD on default.
21	Setup Functions	Lens Calibrate	172-255 Run calibration	0	Locked by channel "Lens shift enable"
22	Setup Functions	Lamp Power	Scaled as % of total control range. Examples are given for 350W lamps: 0 0% 300 Watt — 127 50% 335 Watt — 255 100% 370 Watt	255	Depends on what lamps are used, power rating may be different scale.

Channel	Group	Name	Description	Default Value	Notes
23	Setup Functions	Lamp Mode	0-85 Auto Select Single lamp 172-255 Dual Lamp Mode	128	Does not change lamp mode on default.
24	Setup Functions	Test Pattern	0-19 Off 20-39 Grid 40-59 Grey Scale 16 60-79 White 80-99 Flat Grey 100-119 Black 120-139 Checker 140-159 13 Point 160-179 Color Bars 180-199 Aspect Ratio 200-219 Edge Blend 220-239 Boresight	0	
25	Colormetry	Brightness	0 to 255 Scaled as % of total control range, which is 0 to 100	128	
26	Colormetry	Contrast	0 to 255 Scaled as % of total control range, which is 0 to 100	128	
27	Colormetry	Gamma	0 to 255 Scaled as % of total control range, which is -100 to 100	128	
28	Colormetry	Color Space	0-49 RGB 50-99 YCbCr SDTV (ITU-R BT. 601) 100-149 YCbCr HDTV (ITU-R BT.709)	0	
29	Colormetry	Output Color	0-19 Max Drivers 20-39 Color Temperature (enables 31) 40-59 SD Video 60-79 HD Video 80-99 User setting 1 100-119 User setting 2 120-139 User setting 3 140-159 User setting 4	0	
30	Colormetry	Color Purity Filter	0-85 CPF Off 172-255 CPF On This is the global CPF control, not the channel control.	0	

Channel	Group	Name	Description	Default Value	Notes
31	Colormetry	Interpolated Color (Temperature)*	0 to 255 Scaled as % of total control range, which is 3200 to 9300	128	*Output Color control must be set to "Color Temperature" in DMX channel 29
32	Advanced Image	Blend enable	0-19 Blend disable 20-39 Standard Blend enable 40-59 User Blend 1 enable 60-79 User Blend 2 enable — 220-239 user Blend 10 enable	0	The list of blends depends on the blends having been saved on the projector by the user.
33	Advanced Image	Warp/keystone enable	0-19 Warp/keystone disable 20-39 2D Keystone enable 40-59 Warp 1 enable — 220-239 Warp 10 enable	0	The list of warps depends on the warps having been saved on the projector by the user.
34	Real Time Events	RTE 1	0-85 Cancel current running RTE 172-255 Triggers RTE 1	128	
35	Real Time Events	RTE 2	0-85 Cancel current running RTE 172-255 Triggers RTE 2	128	
36	Real Time Events	RTE 3	0-85 Cancel current running RTE 172-255 Triggers RTE 3	128	
37	Reserved		Reserved for future expansion	No reset	
38	Reserved		Reserved for future expansion	No reset	

## M Series show personality

Learn the channels and descriptions for this personality.

Channel	Group	Name	Description	Default value	Notes
1	Safety	Slider Lock	0-171 Locked 172-255 Unlocked	255	No channel changes are applied when this control is locked.  Channel changes made while the slider is locked are applied once the slider becomes unlocked.
2	Video	Fade to/ from Black	0-85 Black screen (Picture mute ON)	255	To manually control the fade to black time, the



Channel	Group	Name	Description	Default value	Notes
			172-255 Live video (Picture mute OFF)		brightness channel can be used to achieve the same effect.
3	Lens	Shutter	0-85 Shutter Closed (Black Screen) 172-255 Shutter Open (Live Video)	255	
4	Lens	Lens shift enable	0-85 Lens shift disable 172-255 Lens shift enable	255	Lock all lens motors.
5	Lens	Zoom (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	128	Locked by channel "Lens shift enable"
6	Lens	Zoom (Fine)		0	
7	Lens	Focus (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	128	Locked by channel "Lens shift enable"
8	Lens	Focus (Fine)		0	
9	Lens	Lens Horizontal position (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 4096	128	Locked by channel "Lens shift enable"
10	Lens	Lens Horizontal position (Fine)		0	
11	Lens	Lens Vertical position (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 4096		Locked by channel "Lens shift enable"
12	Lens	Lens Vertical position (Fine)			
13	Input	Channel	Projector Channel Selection 0 to 9 Projector Channel 1 10 to 19 Projector Channel 2 20 to 29 Projector Channel 3 .... 180 to 189 Projector Channel 19 190 to 199 Projector Channel 20	255	
14	Input	Input	Input Selection	255	Does not change input on default.

Channel	Group	Name	Description	Default value	Notes
			0 to 9 Slot 1, Input 1 10 to 19 Slot 1, Input 2 .... 50 to 59 Slot 1, Input 6 60 to 69 Slot 2, Input 1 .... 110 to 119 Slot 2, Input 6 120 to 129 Slot 3, Input 1 .... 170 to 179 Slot 3, Input 6 180 to 189 Slot 4, Input 1 .... 230 to 239 Slot 4, Input 6		
15	Image	Image Freeze	0-85 Unfreeze image 172-255 Freeze image	0	
16	Lamps/ Power	Power	0-85 Power Off (Switch lamps off, cool lamps down and go to Standby mode) 172-255 Power On (Switch lamps on, warm up mode)	128	A five second timer is used before executing a power state change. If the slider moves out of the On/Off range within the five seconds, the timer is cancelled.  Does not change power state on default.
17	Reserved		Reserved for future expansion	No Reset	
18	Reserved		Reserved for future expansion	No Reset	

## M Series Nitro VIP projector yoke personality

Learn the channels and descriptions for this personality.

Channel	Group	Name	Description	Default value	Notes
1	Video	Fade to/ from black	0-85 Black screen (Picture mute ON) 172-255 Live video (Picture mute OFF) 0 Shutter Closed 1-255 Shutter Open	255	If a value of 0 is set, the shutter is closed. Any non-zero values open the shutter.  If you wish to manually control the fade to black time, the brightness channel can be used to achieve the same effect.

Channel	Group	Name	Description	Default value	Notes
2	Lens	Shutter	0-85 Shutter Closed (Black Screen) 172-255 Shutter Open (Live Video)	255	
3	Lens	Lens shift enable	0-85 Lens shift disable 172-255 Lens shift enable	255	Locks all lens motors
4	Lens	Zoom (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	128	Locked by channel "Lens shift enable"
5	Lens	Zoom (Fine)		0	
6	Lens	Focus (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	128	Locked by channel "Lens shift enable"
7	Lens	Focus (Fine)		0	
8	Lens	Lens Horizontal position (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	128	Locked by channel "Lens shift enable"
9	Lens	Lens Horizontal position (Fine)		0	
10	Lens	Lens Vertical position (Coarse)	0 to 255 Scaled as % of total control range, which is 0 to 2100	128	Locked by channel "Lens shift enable"
11	Lens	Lens Vertical position (Fine)		0	
12	Input	Input	Projector Channel Selection 1 to 20 Projector Channel 1 to 20 — 86 LOAD — Input Selection 111 to 116 Slot 1, Input 1 to 6 121 to 126 Slot 2, Input 1 to 6 131 to 136 Slot 3, Input 1 to 6 141 to 146 Slot 4, Input 1 to 6 —	255	

Channel	Group	Name	Description	Default value	Notes
			171 EXECUTE		
13	Image	Size	0 to 255 Scaled as % of total control range, which is 200 to 4000	67	
14	Image	Vertical Stretch	0 to 255 Scaled as % of total control range, which is 200 to 3000	91	
15	Macro	Function	Projector Orientation 0-9 Front Projection 10-19 Rear Projection 20-29 Front Projection Inverted 30-39 Rear Projection Inverted — On Screen Display 40-59 OSD On 50-59 OSD Off 60-69 Lens Calibrate — 86 LOAD — Test Pattern 100-104 Off105-109 Grid 110-114 Grey Scale 16 115-119 White 120-124 Flat Grey 125-129 Black 130-134 Checker 135-139 13 Point 140-144 Color Bars 145-149 Aspect Ratio 150-154 Edge Blend 155-159 Boresight — 171 EXECUTE — Image Freeze 200-209 Freeze image 210-219 Unfreeze image	255	Lens Calibrate is locked by channel "Lens shift enable".

Channel	Group	Name	Description	Default value	Notes
16	Lamp/Power	Lamp/Power functions	<p>Lamp Power</p> <p>Scaled as % of total control range,.</p> <p>Examples are given for 350W:</p> <p>00 0% 300 Watt</p> <p>—</p> <p>10 310 Watt</p> <p>—</p> <p>20 320 Watt</p> <p>—</p> <p>30 330 Watt</p> <p>—</p> <p>40 340 Watt</p> <p>—</p> <p>50 350 Watt</p> <p>—</p> <p>60 360 Watt</p> <p>—</p> <p>70 100% 370 Watt</p> <p>86 LOAD</p> <p>171 EXECUTE</p> <p>Lamp Mode</p> <p>90 Auto select Single Lamp</p> <p>95 Dual Lamp Mode</p> <p>Power Mode</p> <p>100 Power Off (Switch lamps off, cool lamps down and go to Standby mode)</p> <p>105 Power On (Switch lamps on, warm up mode)</p>	255	
18	Colormetry	Contrast	0 to 255 Scaled as % of total range, which is 0 to 100	128	
19	Colormetry	Gamma	0 to 255 Scaled as % of total range, which is -100 to 100	128	
17	Colormetry	Brightness	0 to 255 Scaled as % of total range, which is 0 to 100	128	

Channel	Group	Name	Description	Default value	Notes
20	Colormetry	Video Signal/Color space, Output Color, and CPF	Color Space 0-9 RGB 10-19 YCbCr SDTV (ITU-R BT.601) 20-29 YCbCr HDTV (ITU-R BT.709) 86 LOAD Output Color 90-99 Max Drives 100-109 Color Temperature (enables 21) 110-119 SD Video 120-129 HD Video 130-139 User setting 1 140-149 User setting 2 150-159 User setting 3 160-169 User setting 4 171 EXECUTE Yellow Notch Filter 180-189 CPF Off 190-199 CPF On This is the global CPF control, not the channel control.	255	
21	Colormetry	Interpolated Color (Temperature)*	0 to 255 Scaled as % of total control range, which is 3200 to 9300	128	*Output Color control must be set to "Color Temperature" in DMX channel 20.
22	Advanced Image	Blend and Warp/keystone enable	Blend 0-4 Blend disable 5-9 Standard Blend enable 10-14 User Blend 1 enable 15-19 User Blend 2 enable — 60-64 User Blend 11 enable 86 LOAD 171 EXECUTE Output Color 180-184 Warp/keystone disable	255	The list of warp and blends available depends on the warps and blends saved on the projector by the user.

Channel	Group	Name	Description	Default value	Notes
			185-189 2D Keystone enable 190-194 Warp 1 enable — 240-244 Warp 11 enable		
23	Real Time Events	RTE	0-9 Cancel current running RTE 10-19 Triggers RTE 1 20-29 Triggers RTE 2 30-39 Triggers RTE 3 40-49 Triggers RTE 4 50-59 Triggers RTE 5 60-69 Triggers RTE 6 70-79 Triggers RTE 7 86 LOAD 171 EXECUTE	255	
24	Reserved		Reserved for future expansion	0	

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