

INSIGHT 4K Laser Series

High Brightness Digital Video Projector

- ▶ INSTALLATION AND QUICK-START GUIDE
- ▶ CONNECTION GUIDE
- ▶ OPERATING GUIDE
- ▶ REFERENCE GUIDE



About This Document

Follow the instructions in this manual carefully to ensure safe and long-lasting use of the projector.

Symbols used in this manual

Many pages in this document have a dedicated area for notes. The information in that area is accompanied by the following symbols:



WARNING: this symbol indicates that there is a danger of physical injury to yourself and/or damage to the equipment unless the instructions are closely followed.



ELECTRICAL WARNING: this symbol indicates that there is a danger of electrical shock unless the instructions are closely followed.



LASER WARNING: this symbol indicates that there is a potential hazard of eye exposure to laser radiation unless the instructions are closely followed.



NOTE: this symbol indicates that there is some important information that you should read.

Product revision

Because we at Digital Projection continually strive to improve our products, we may change specifications and designs, and add new features without prior notice.

Legal notice

Trademarks and trade names mentioned in this document remain the property of their respective owners. Digital Projection disclaims any proprietary interest in trademarks and trade names other than its own.

Notes

Laser Information



Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes

Introduction

Congratulations on your purchase of this Digital Projection product.

Your projector has the following key features:

- 4K resolution up to 60 fps via single DisplayPort input.
- Dual Pipe input capability (2 x DisplayPort 1.2).
- Full 4K 3D display capability.
- Scaling of HDMI 1.4 formats to 4K resolution.
- 3G-SDI.
- Blanking control for custom input window sizing.
- Control via LAN and RS232.
- Motorised lens mount.

A serial number is located on the product label. Record it here:

Notes

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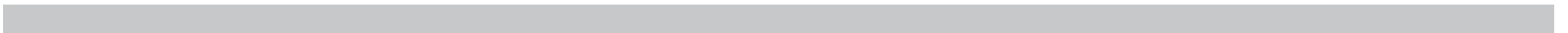
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INSIGHT 4K Laser Series

High Brightness Digital Video Projector

▶ INSTALLATION AND QUICK-START GUIDE



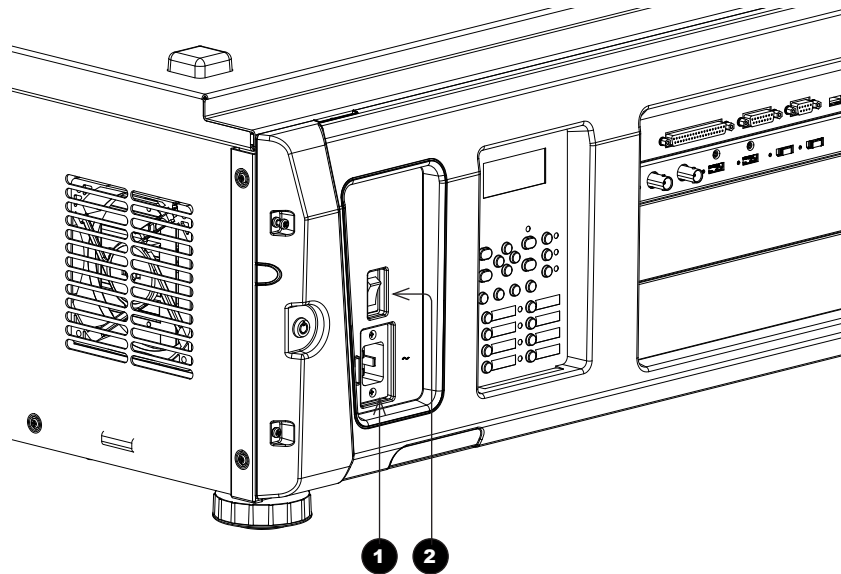
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Connecting The Power Supply

When the projector is viewed from the back, the **AC mains inlet** **1** is located on the right hand side, toward the rear.

Make sure the **power switch** **2** above the inlet is in the OFF position, then push the mains connector in firmly.



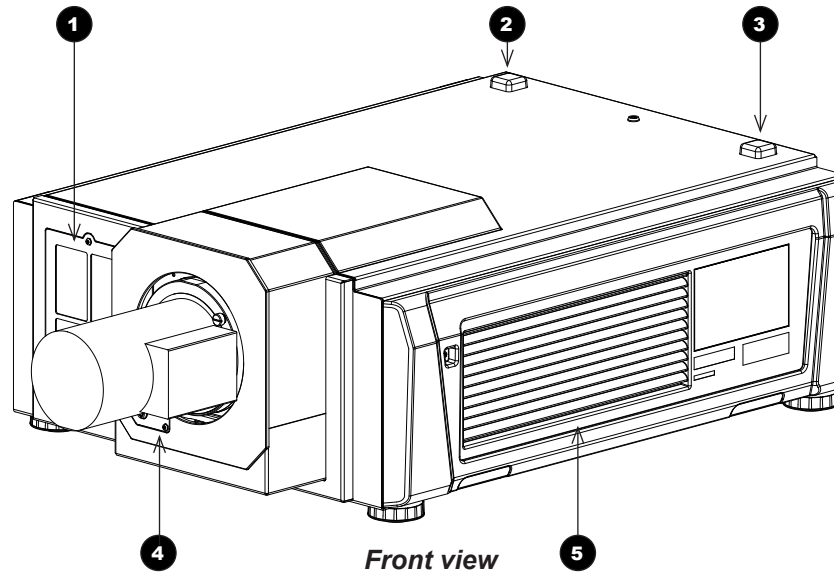
Notes

-  Use only the power cable provided.
-  Ensure that the power outlet includes a ground connection as this equipment **MUST** be earthed.
-  Handle the power cable carefully and avoid sharp bends. Do not use a damaged power cable.

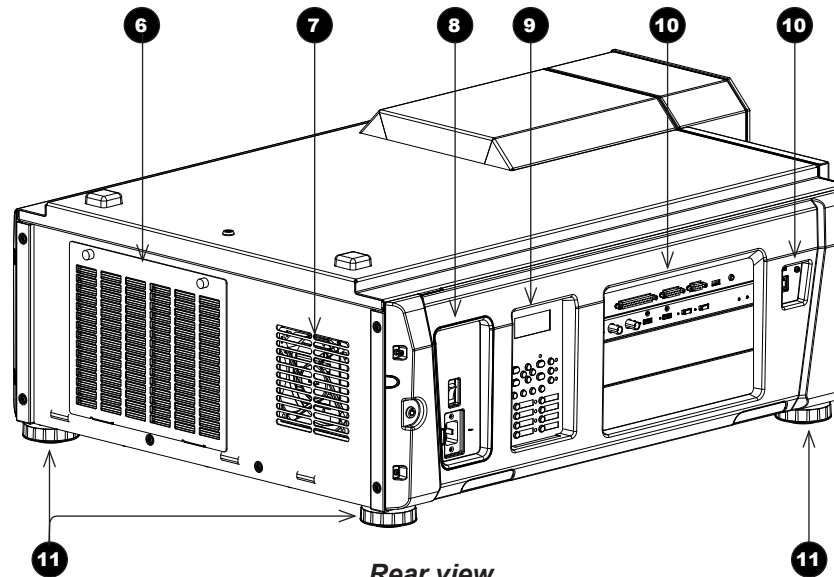
Projector Overview

Front and rear views

- 1** Air inlet and filter
- 2** **SYSTEM** status indicator
When the projector is operating normally, this indicator lights green or orange. If an error occurs, the light becomes red. Depending on the scenario, the light can be steady or flashing.
- 3** **LIGHT** status indicator
Turns on when the light source is switched on.
- 4** Lens
- 5** Air outlet
- 6** Air inlet and filter
- 7** Air outlet
- 8** Power switch and power connection
- 9** Control panel with LED screen
- 10** Connections
- 11** Adjustable feet



Front view

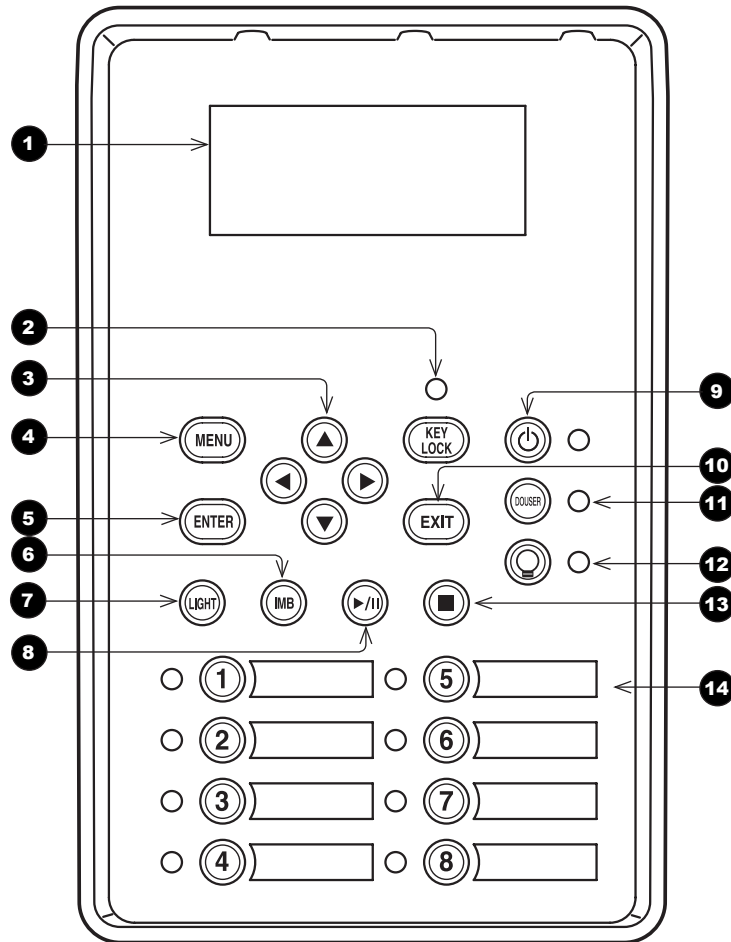


Rear view

Notes

Control panel

- 1 LCD display
- 2 KEY LOCK button (with indicator)
- 3 Arrow buttons
- 4 MENU button
- 5 ENTER button
- 6 *not used in this configuration (except for entering alphanumeric values)*
- 7 LIGHT button
- 8 *not used in this configuration*
- 9 POWER button (with indicator)
- 10 EXIT button
- 11 DOUSER button (with indicator)
- 12 LIGHT ON / OFF button (with indicator)
- 13 *not used in this configuration*
- 14 Preset buttons 1 to 8 (with indicators)





Notes




 See [Entering alphanumeric values](#) in the *Operating Guide*.

Control panel button indicators



- 1 KEY LOCK**

Behavior	Meaning
Off	 Key lock is inactive.
On	 Key lock is activated.



- 2 POWER ON / OFF**

Behavior	Meaning
Off	 The projector is switched off from the power supply or in STANDBY mode.
Flashing green	 The projector is warming up (preparing to switch ON) or cooling down (preparing to switch OFF).
Steady green	 The projector is switched on.




- 3 DOUSER ON / OFF**

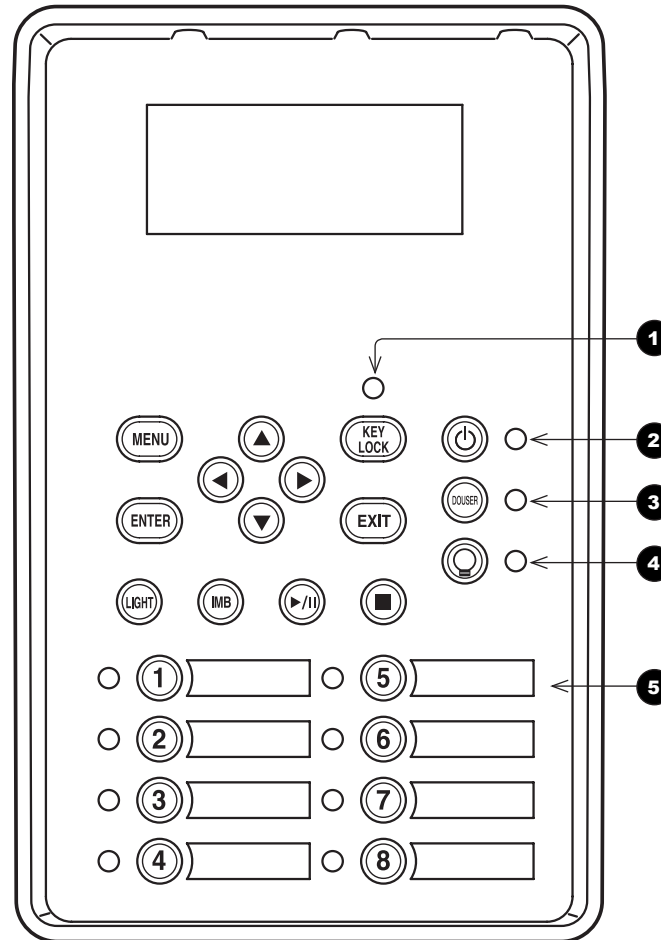
Behavior	Meaning
Off	 The douser is opened.
Steady green	 The douser is closed.

- 4 LIGHT ON / OFF**

Behavior	Meaning
Off	 The light source is switched off.
Steady green	 The light source is switched on.

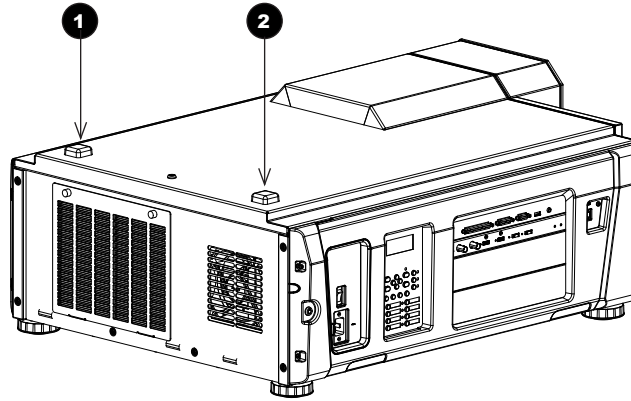
- 5 Presets**

Behavior	Meaning
Off	 The title is not assigned to the projector.
Steady white	 The title is assigned to the projector but is not currently in use.
Steady green	 The title is assigned to the projector and is currently in use.



Notes

Status indicators



1 LIGHT status indicator

Behavior		Meaning
Off	●	The light source is switched off.
On	●	The light source is switched on.

2 SYSTEM status indicator

Behavior		Meaning
Off	●	The projector is switched off.
Flashing green	●	The projector is warming up. The douser is closed and the light source is off.
Steady green	●	The projector is switched on.
Flashing amber	●	The projector is cooling down.
Steady amber	●	The projector is in standby.
Flashing red	●	Error, projection cannot continue. Check LCD screen for error message.
Flashing red, with buzzer	●	Error with safety implications. Projection cannot continue. Check LCD screen for error message.
Steady red	●	Nonfatal error, projection may continue. Check LCD screen for error message.

Notes

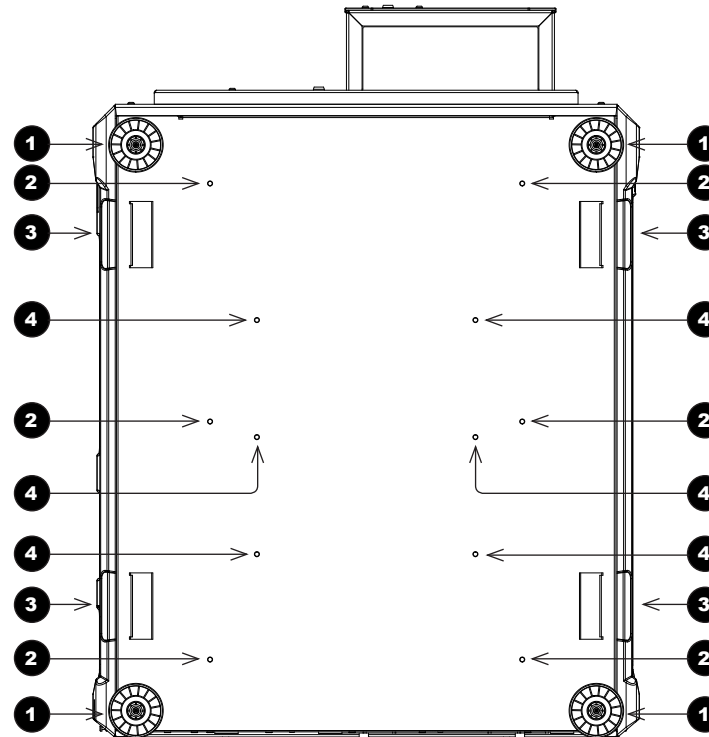
Positioning The Screen And Projector

Installation should be carried out by authorised personnel only.




1. Install the screen, ensuring that it is in the best position for viewing by your audience.
2. Mount the projector, ensuring that it is at a suitable distance from the screen for the image to fill the screen. Set the adjustable feet so that the projector is level, and perpendicular to the screen.

The drawing below shows the bottom of the projector. The positions of the feet for table mounting, and the fixing holes for ceiling mounting are clearly visible. The illustration also shows the positions of the four handles which facilitate safe carriage.

- 1** Four adjustable feet
- 2** Six M6 holes for ceiling mount (set A)
The screws should not penetrate more than 15 mm into the body of the projector.
- 3** Handles for safe carriage
- 4** Six M6 holes for ceiling mount (set B)
The screws should not penetrate more than 15 mm into the body of the projector.



Notes

-  **Always allow the projector to cool for 5 minutes before disconnecting the power or moving the projector.**
-  **Ensure that there is at least 30 cm (12 in) of space between the ventilation outlets and any wall, and 10 cm (4 in) on all other sides.**
-  **Projectors are not designed to be stacked on top of each other unless a rigging frame is used.**

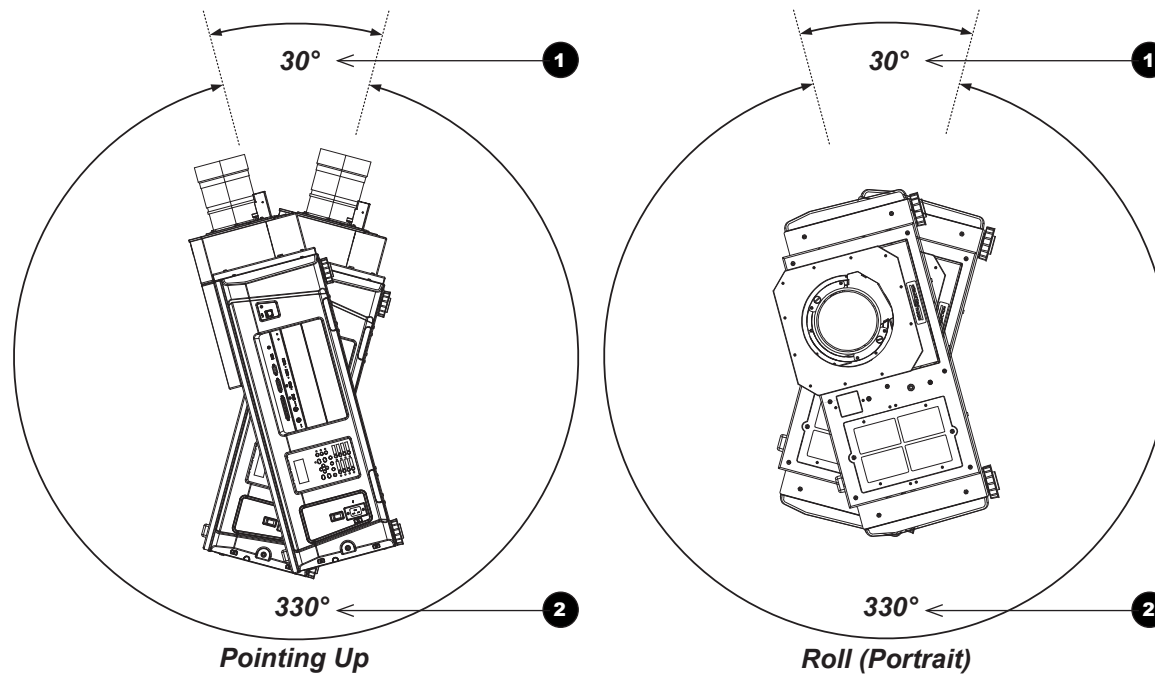
Tilting restrictions

The projector can be operated in numerous positions.


The only non-workable angles are:

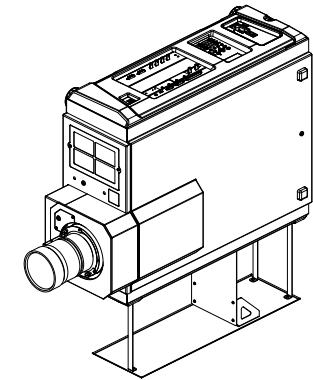
- Upright mode with lens pointing upward.
- Portrait mode with inputs facing downward.

The diagram below illustrates both positions showing **non-workable angles 1** and **workable angles 2**:



Notes

 Portrait mode installation requires fitting a safety guard underneath the projector (as shown in the illustration below). Unauthorised personnel should not attempt to carry out portrait mode installation. Please contact Digital Projection or a dealer if you wish to use the projector in portrait mode.

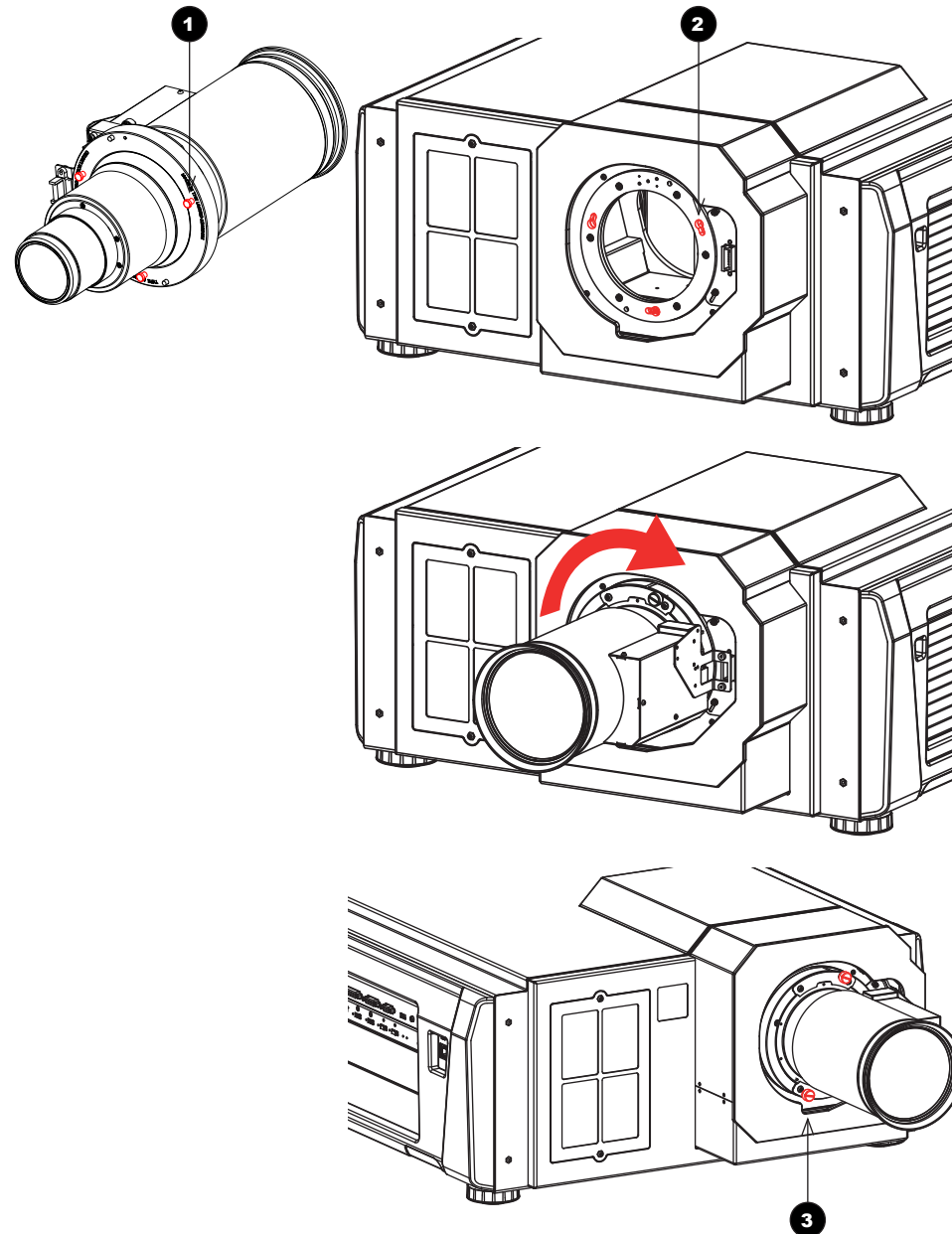


Fitting The Lens


1. Insert the lens into the mount.
Engage the three **locating studs** **1** into the corresponding **slots** **2** on the mount.


2. Rotate the lens clockwise until the studs slide all the way into the slots.


3. Tighten the two **fixing screws** **3** on the lens collar.





Notes


-  This procedure applies to **version C** of the projector. If your projector is an earlier version or if you are unsure which version you have, see [Appendix G](#) in the *Reference Guide*.


-  **Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.**


-  **When changing the lens, avoid using excessive force as this may damage the equipment.**

-  Take care to preserve the original lens packaging and protective caps for future use.

-  The projector will not power on without the lens fitted.

-  Before turning on the projector, please ensure the protective caps are removed from the front and rear of the lens.

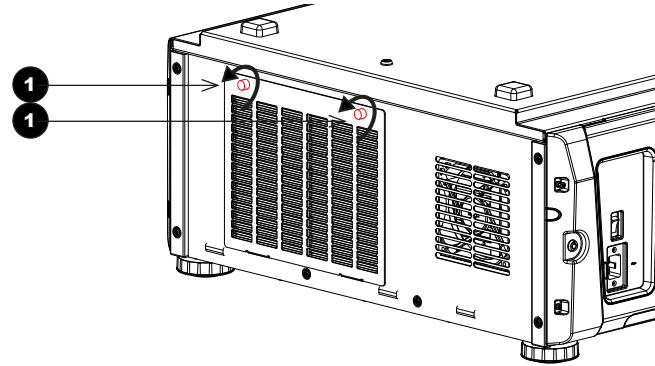
-  **The two fixing screws must be tightened to at least a torque of 0.5 N-m using a screwdriver. Loose screws might lead to the lens falling off.**

-  When a new lens is fitted, a calibration procedure must be carried out. For more information, see [Calibrating zoom and focus](#) further in this guide.

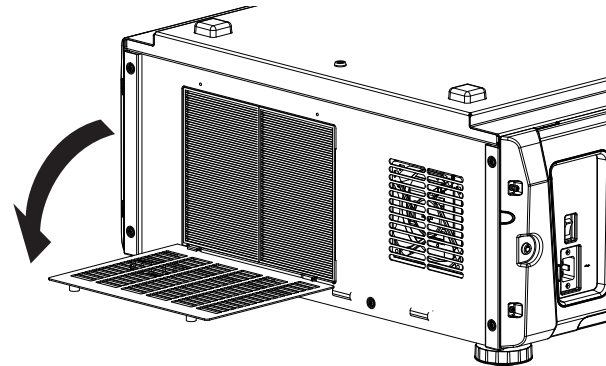
Cleaning And Replacing The Filters

Rear filters

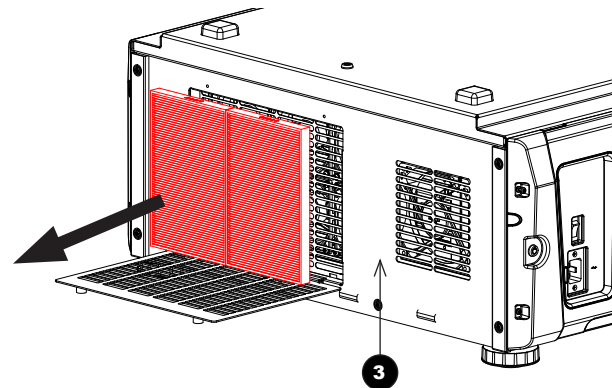
1. Loosen the two **knobs** **1** holding the filter cover by turning them counterclockwise.
Use a Phillips screwdriver if necessary.




2. Tilt the filter cover to open it.





3. Remove the filters. Grasp the top and bottom or left and right ends of each air filter and remove it by pulling toward you.




Notes

 The knobs are captive on the removable cover.

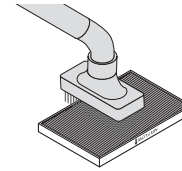
 Before changing the filters, always make sure the projector is switched off and fully disconnected from its power supply.

 When changing the filters, avoid using excessive force as this may damage the equipment.

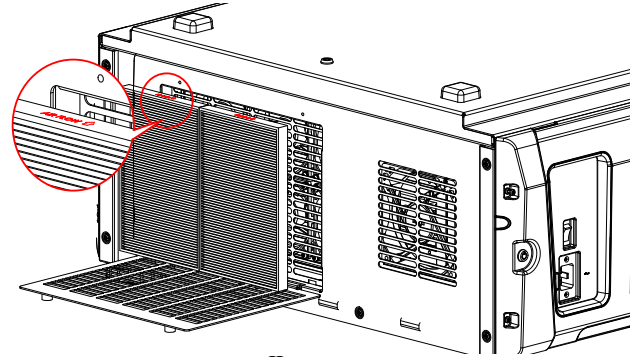
 Filters should be replaced when new light sources are fitted, or as necessary upon visual inspection and in accordance with operating environment.

- If you are replacing the filters, skip this step.

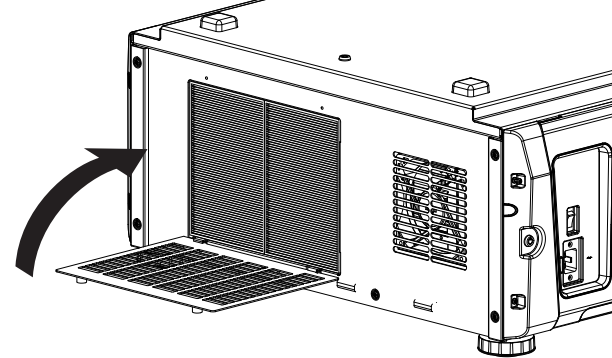
To clean the filters, use a vacuum cleaner brush attachment to vacuum away dust from the air filters. Avoid making direct contact without an attachment or using a nozzle attachment.



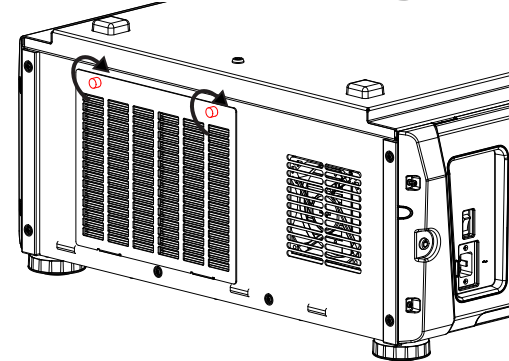
- Mount the air filters to the projector. Look for an arrow (AIR FLOW↑) indicating the installation direction on the side of the air filter. Point the arrow towards the projector.



- Close the filter cover.



- Tighten the knobs clockwise to secure the cover.



Notes



Before changing the filters, always make sure the projector is switched off and fully disconnected from its power supply.



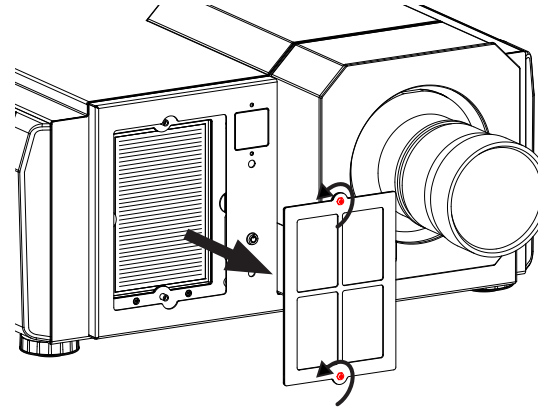
When changing the filters, avoid using excessive force as this may damage the equipment.



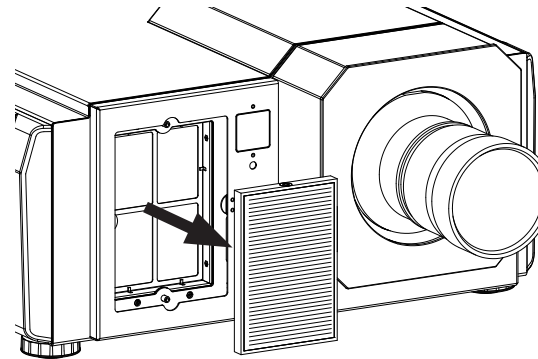
Filters should be replaced when new light sources are fitted, or as necessary upon visual inspection and in accordance with operating environment.

Front filter

1. Loosen the two captive screws on the filter cover and remove the cover.

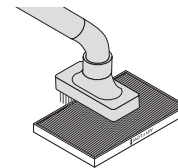


2. Remove the air filter.



3. If you are replacing the filter, skip this step.

To clean the filter, use a vacuum cleaner brush attachment to vacuum away dust from the air filter. Avoid making direct contact without an attachment or using a nozzle attachment.



Notes



Before changing the filters, always make sure the projector is switched off and fully disconnected from its power supply.



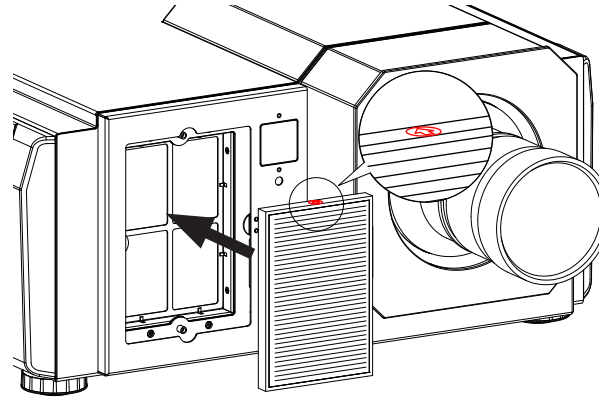
When changing the filters, avoid using excessive force as this may damage the equipment.



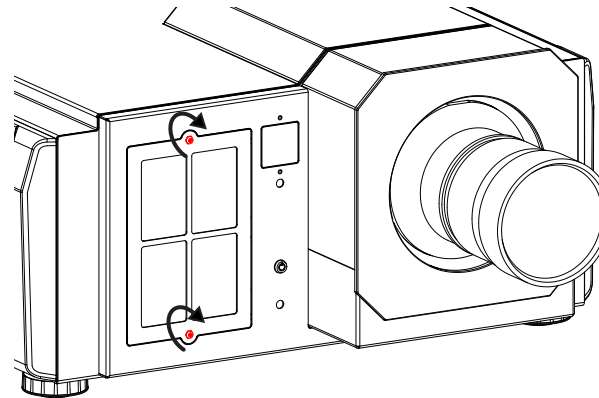
Filters should be replaced when new light sources are fitted, or as necessary upon visual inspection and in accordance with operating environment.

4. Mount the air filter to the projector.

Look for an arrow indicating the installation direction on the side of the air filter. Point the arrow towards the projector.



5. Mount the filter cover to the projector. Tighten the two captive screws to secure the cover.



Notes



Before changing the filters, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the filters, avoid using excessive force as this may damage the equipment.

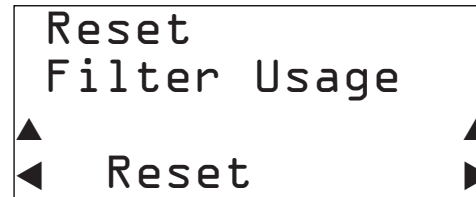



Filters should be replaced when new light sources are fitted, or as necessary upon visual inspection and in accordance with operating environment.

Reset the air filter usage time

1. Turn on the projector.
2. Open the menu and go to **Configuration > Reset**.

Filter Usage resets the filter usage time.

**Notes**

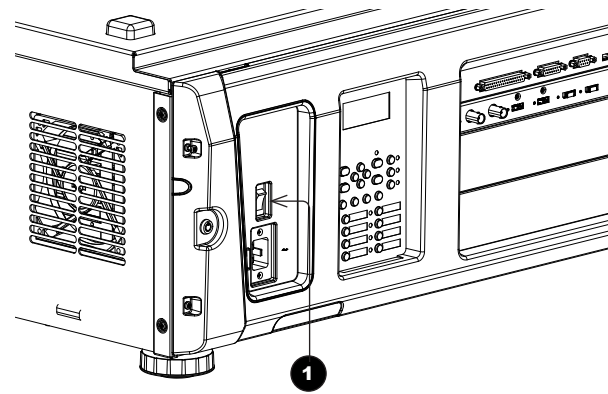
 *Filters should be replaced when new light sources are fitted, or as necessary upon visual inspection and in accordance with operating environment.*

Operating The Projector

Switching the projector on

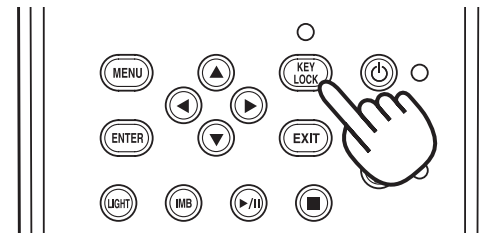
1. Make sure the **power switch** **1** above the AC mains inlet is in the OFF position. Connect the power cable between the mains supply and the projector, then turn the power switch on.

The **SYSTEM** status indicator lights a steady amber to show that the projector is now in STANDBY mode.



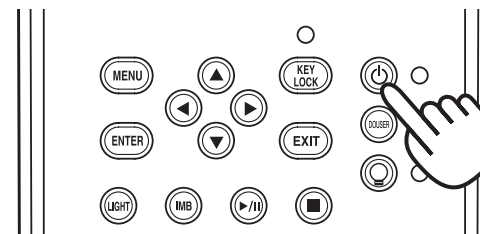
2. (*optional step*) If no button is pressed within 30 seconds of the projector entering STANDBY mode, the control panel becomes locked.

To unlock the control panel, press and hold the **KEY LOCK** button for one second or longer.



3. To switch from STANDBY to ON mode, press and hold the **POWER** button for three seconds or longer.

During the startup process, the **SYSTEM** status indicator flashes green. When the projector is fully switched on, the **SYSTEM** status indicator lights a steady green.



Notes

See also [Connecting The Power Supply](#) earlier in this guide.

Do not turn off the projector from the power switch or disconnect the power cord while the projector is working or cooling down.

Use only the power cable provided.

Ensure that the power outlet includes a ground connection as this equipment **MUST** be earthed.

Handle the power cable carefully and avoid sharp bends. Do not use a damaged power cable.

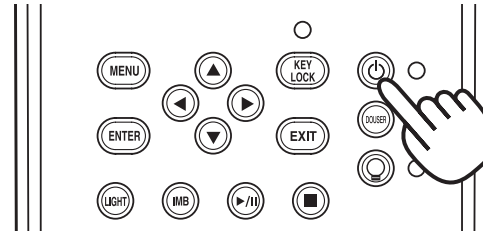
Switching the projector off

1. Press and hold the **POWER** button for three seconds or longer.

The light source switches off and the projector begins cooling down. During the cooling down process, the **SYSTEM** status indicator flashes amber. The fan continues to work and a message is displayed on the LCD screen to show that the projector is still not switched off.

When the fan switches off, the **SYSTEM** status indicator lights a steady amber to indicate that the projector is now in STANDBY mode.

2. To switch the projector off completely, turn the power switch OFF.



Notes



Do not turn off the projector from the power switch or disconnect the power cord while the projector is working or cooling down.



Use only the power cable provided.



Ensure that the power outlet includes a ground connection as this equipment **MUST be earthed.**



Handle the power cable carefully and avoid sharp bends. Do not use a damaged power cable.

Selecting a title or test pattern

The projector arrives with titles and test patterns already configured. If you need to change the configuration, contact your dealer.

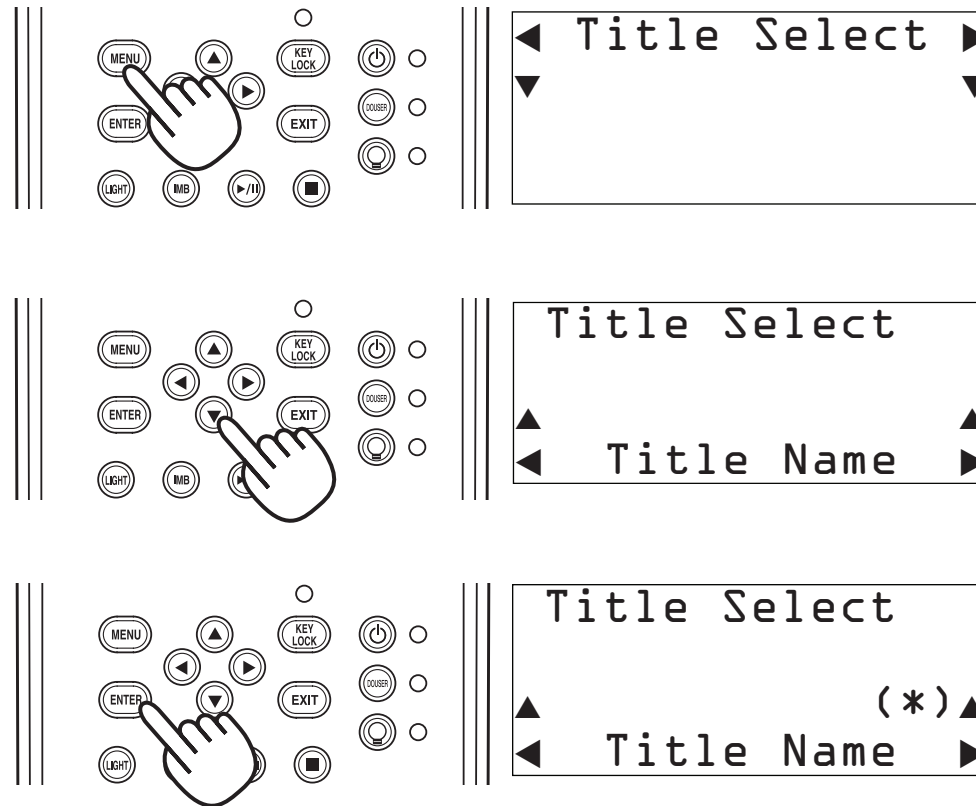
Selecting a title

Connect the title you wish to display and switch on the input source, then switch on the projector. If necessary, unlock the keypad.


If the title is assigned a shortcut, press the shortcut button and the projector will begin displaying the title.


If there is no shortcut assigned to the title:

1. Press the **MENU** button.
2. Press the **LEFT** or **RIGHT** button to cycle through the list of menus until **Title Select** appears on the LCD screen. The list of menus is as follows:
 - **Title Select**
 - **Configuration**
 - **(Title Setup)**
 - **Information**
 - **...**
3. When **Title Select** is displayed, press **DOWN**.
4. Press **LEFT** or **RIGHT** to go through the list of available titles until you reach the title you wish to display.
5. Press **ENTER** to confirm your choice. The projector begins displaying the title. An asterisk mark (*) appears on the LCD screen to indicate the current selection.



Notes

 For detailed information about switching on the projector and unlocking the keypad, see [Switching the projector on](#) earlier in this guide.

 Menus and menu items displayed in parentheses can only be accessed by service personnel.

Selecting a test pattern

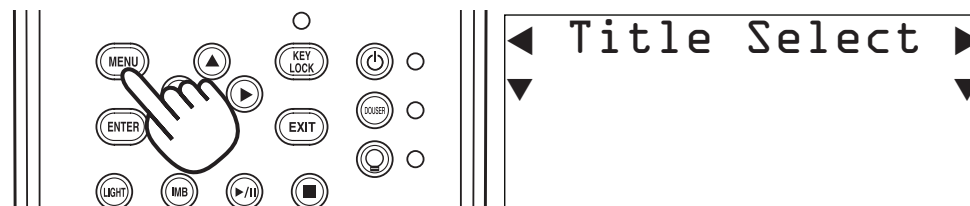
Switch on the projector and, if necessary, unlock the keypad.

If the test pattern is assigned a shortcut, press the shortcut button and the projector will begin displaying the test pattern.

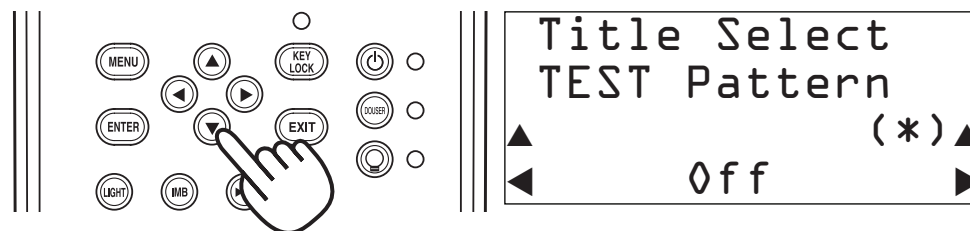
If there is no shortcut assigned to the test pattern:

1. Press the **MENU** button.
2. Press the **LEFT** or **RIGHT** button to cycle through the list of menus until **Title Select** appears on the LCD screen. The list of menus is as follows:

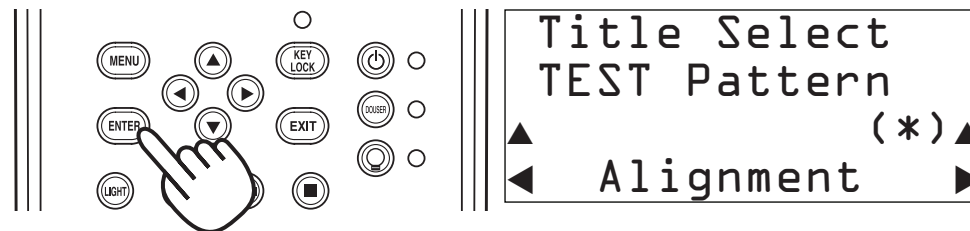
- **Title Select**
- **Configuration**
- **(Title Setup)**
- **Information**
- ...



3. When **Title Select** is displayed, press **DOWN**.
4. Press **LEFT** or **RIGHT** until **Title Select** is set to **TEST Pattern**.
5. Press **DOWN** again, then press **LEFT** or **RIGHT** to cycle through the list of test patterns.




6. When you have arrived at the test pattern you wish to display, press **ENTER** to confirm your choice. The projector begins displaying the test pattern. An asterisk mark (*) appears on the LCD screen to indicate the current selection.



To cancel test pattern display, cycle through the list again and select OFF, then press **ENTER** to confirm your choice.

Notes

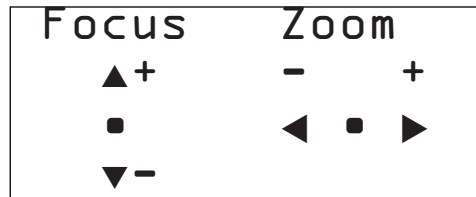
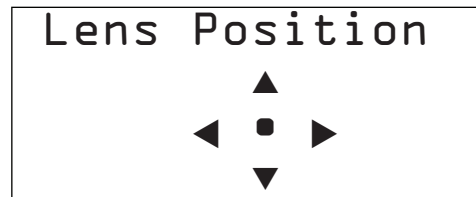
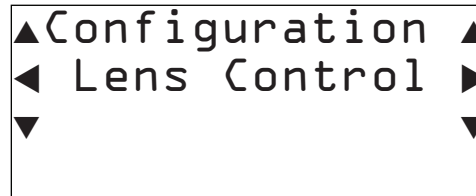
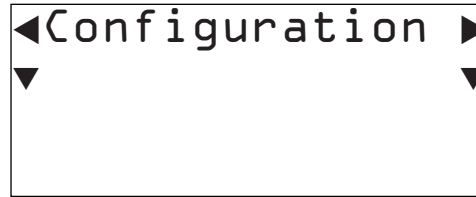
 For detailed information about switching on the projector and unlocking the keypad, see [Switching the projector on](#) earlier in this guide.

Adjusting the lens

1. Press **MENU**.
2. Press the **LEFT** or **RIGHT** button to cycle through the list of menus until **Configuration** appears on the LCD screen. The list of menus is as follows:
 - **Title Select**
 - **Configuration**
 - **(Title Setup)**
 - **Information**
 - ...
3. Press **DOWN** to enter the **Configuration** menu, then press the **LEFT** or **RIGHT** button to cycle through configuration submenus until you reach **Lens Control**.

Lens controls are accessed in two modes - **Lens Position** and **Focus Zoom**. Press **ENTER** to switch between the two modes.

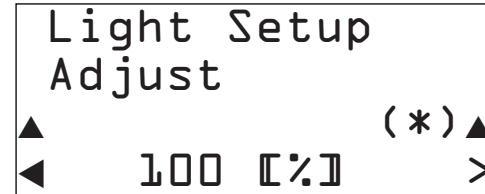
- In **Lens Position** mode, use the arrow buttons to shift the lens in the desired direction.
- In **Focus Zoom** mode, use:
 - **UP** and **DOWN** to change the focus,
 - **LEFT** and **RIGHT** to change the zoom.



Notes

Adjusting the brightness

1. Press **MENU**.
2. Press the **LEFT** or **RIGHT** button to cycle through the list of menus until **Configuration** appears on the LCD screen. The list of menus is as follows:
 - **Title Select**
 - **Configuration**
 - **(Title Setup)**
 - **Information**
 - **...**
3. Press **DOWN** to enter the **Configuration** menu, then press the **LEFT** or **RIGHT** button to cycle through configuration submenus until you reach **Light Setup**.
4. Use the **LEFT** and **RIGHT** arrow buttons to adjust the brightness.



Notes

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INSIGHT 4K Laser Series

High Brightness Digital Video Projector

▶ CONNECTION GUIDE



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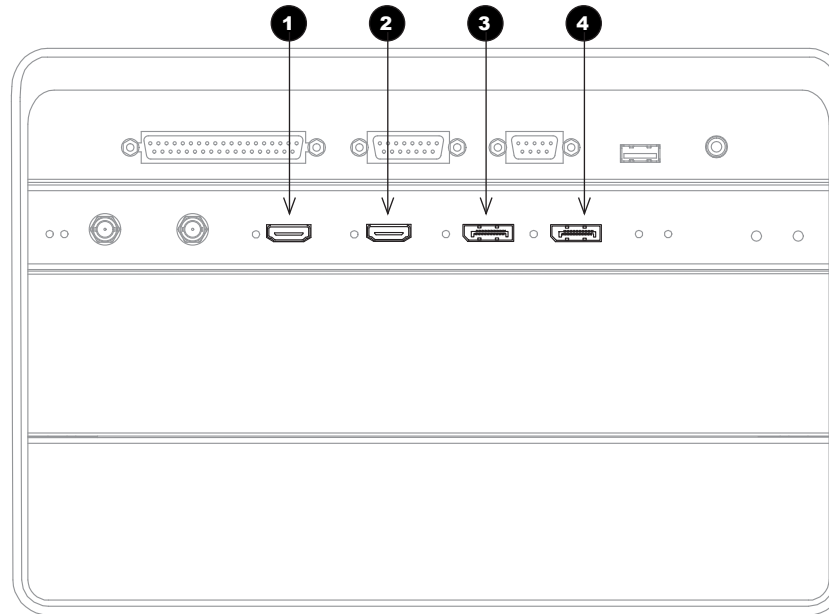
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Signal Inputs

Main connections panel

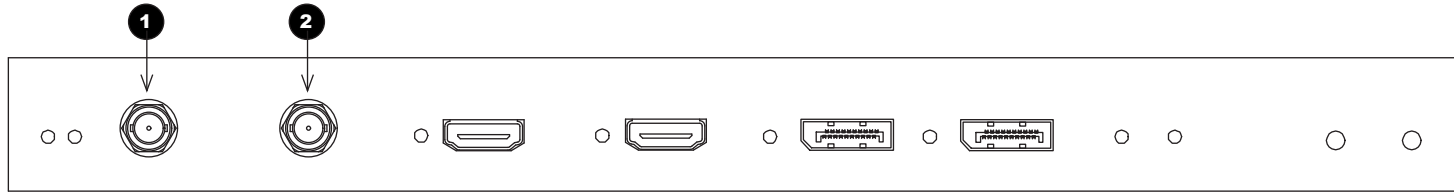
The following inputs are available on the main connections panel:

- 1** **HDMI 1**
HDMI 1.4
- 2** **HDMI 2**
HDMI 1.4
- 3** **DisplayPort 1**
- 4** **DisplayPort 2**



Notes

3D Sync



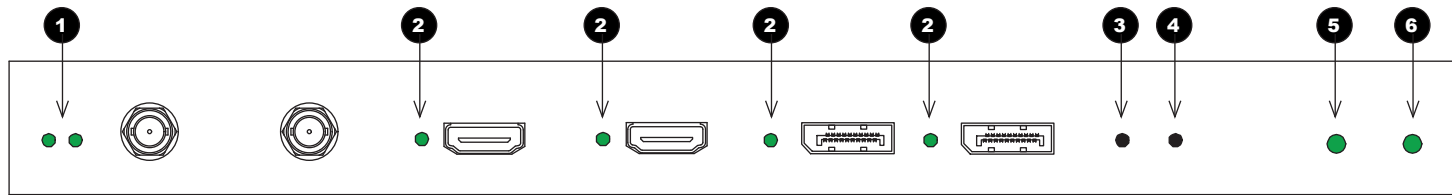
Main connections panel

- 1** **3D Sync In**
Sync input signal
Connect the 3D sync from your graphics card or server.

- 2** **3D Sync Out**
Sync output signal
Connect this to your IR emitter or ZScreen.

Notes

Indicators on the main connections panel



Main connections panel

Notes

- 1 3D Sync In / Out**
These indicators light solid green if 3D sync is present.
- 2 HDMI 1 / HDMI 2 / DisplayPort 1 / DisplayPort 2**
Each of these indicators lights a solid green color if the adjacent input is in use.
If the input is selected but the source is not present, the indicator flashes green.
- 3 Option A**
If an input on Option A board is in use, this indicator lights a solid green color.
If an input on Option A board is selected but the source is not present, the indicator flashes green.
- 4 Option B**
This indicator is not used.
- 5 Power**
This indicator lights a solid green color if the projector is switched on.
- 6 Health**
This indicator flashes amber, then green, during boot up.
When the projector is switched on and fully functional, the indicator lights solid green.

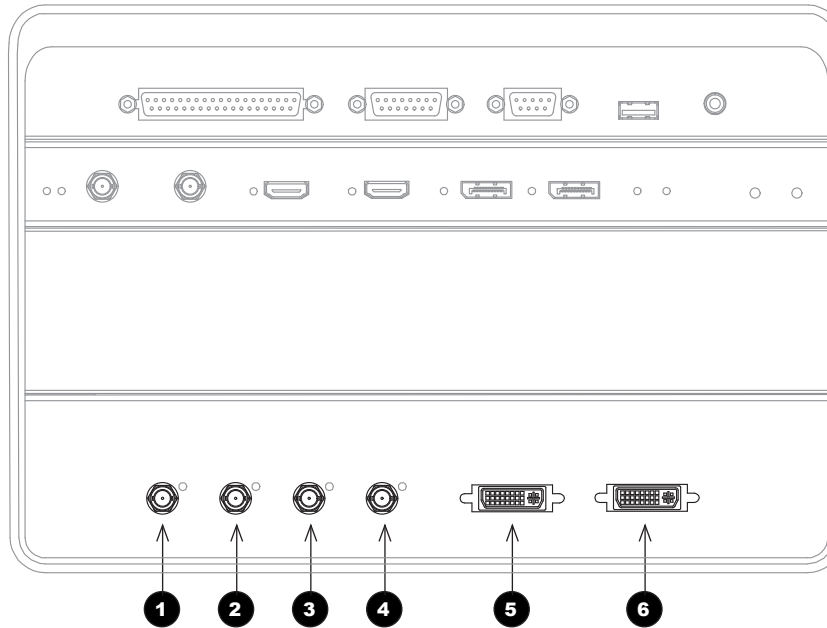


Option board

The **option board** can be installed in addition to the main board. It is not part of the default hardware configuration.

The following additional inputs can be made available if the option board is installed:

- 1** **3G-SDI A**
3G-SDI
- 2** **3G-SDI B**
3G-SDI
- 3** **3G-SDI C**
3G-SDI
- 4** **3G-SDI D**
3G-SDI
- 5** **DVI A**
DVI-D
- 6** **DVI B**
DVI-D



Notes

The SDI inputs can be used for both 3G-SDI and HD-SDI.

The four SDI inputs can be used separately with a 2K or 1080p image, which the projector will scale to 4K, or simultaneously, to project an image from a full 4K source.

The two DVI inputs can be used simultaneously as well, to display native 4K resolution.

EDID on the DVI, HDMI and DisplayPort inputs

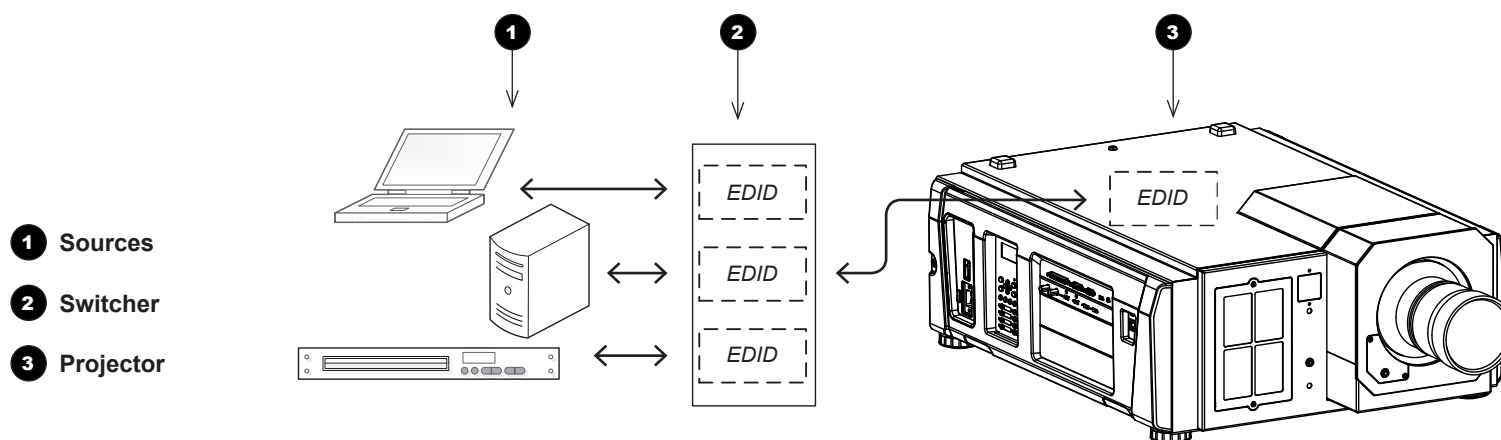
If you are using a computer DVI card or another source that obeys the EDID protocol, the source will automatically configure itself to suit the projector.

Otherwise please refer to the documentation supplied with the source to manually set the resolution to the DMD™ resolution of the projector or the nearest suitable setting. Switch off the source, connect to the projector, then switch the source back on again.

Using HDMI/DVI/DisplayPort switchers with the projector

When using an HDMI/DVI/DisplayPort source switcher with the projector, it is important to set the switcher so that it passes the projector EDID through to the source devices. If this is not done, the projector may not be able to lock to the source or display the source correctly as its video output timings may not be compatible with those of the projector. Sometimes this is called transparent, pass-through or clone mode. See your switcher's manual for information on how to set this mode.

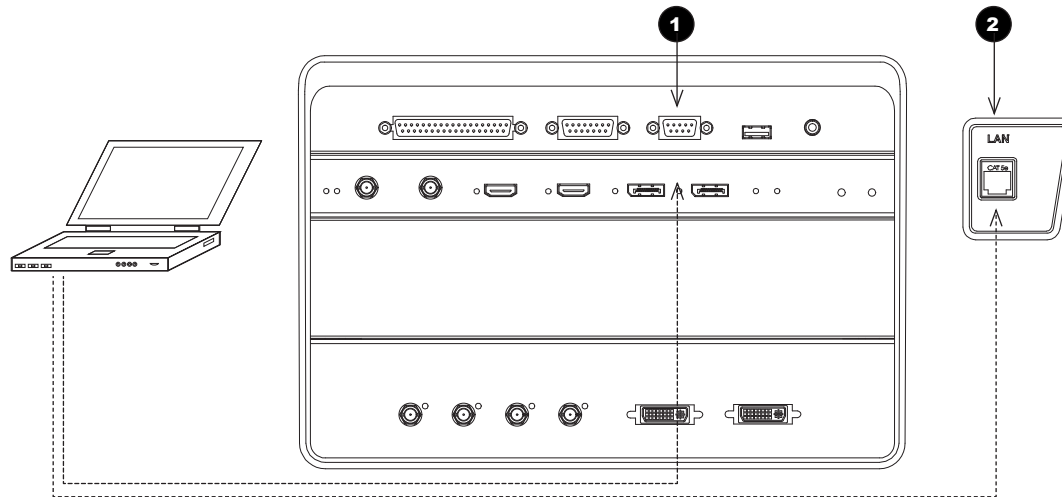
Additionally, sources which use HDCP encryption may not display properly when connected to the projector via a switcher. Refer to the switcher's manual for more information.



The EDIDs in the switcher should be the same as the one in the projector.

Notes

Control Connections



- 1 PC control terminal (RS-232)**
Use this terminal when controlling the projector in serial connection from a PC.
- 2 LAN port (LAN)**
Use this port when controlling the projector in LAN connection from a PC.

Notes



INSIGHT 4K Laser Series

High Brightness Digital Video Projector

▶ OPERATING GUIDE



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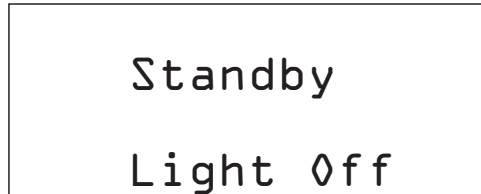
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Using The Control Panel

LCD display overview

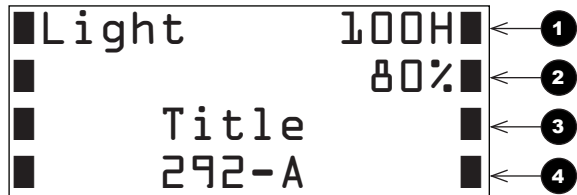
In STANDBY mode

When the projector is in STANDBY mode, the following is displayed on the LCD screen.



In operation

When the projector is in operation, the following is displayed on the LCD screen.

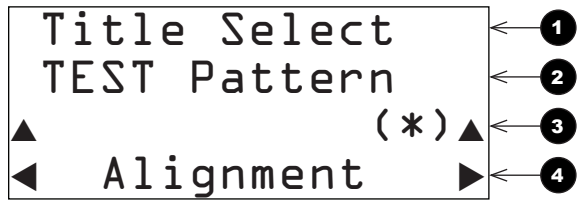


- 1 Hours of light source use
- 2 Light source output (brightness)
- 3 Selected title
- 4 Selected video input port

Notes

When showing menus

Typically the LCD display shows information on four lines:



- 1 Menu name
- 2 Submenu or setting name
- 3 An asterisk indicates the value shown below is the currently assigned value
- 4 Value of the setting

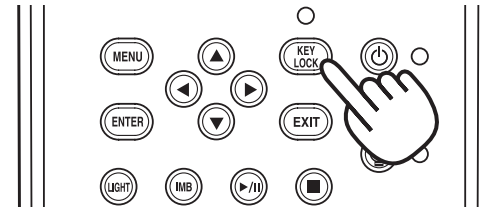
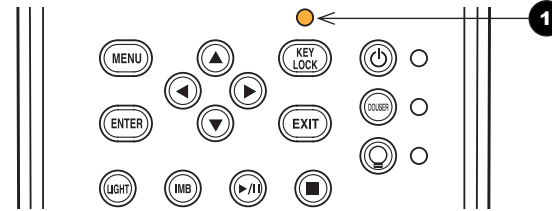
Notes

Locking and unlocking the control panel

Depending on the **Auto Key Lock** setting, the control panel may automatically lock itself following a period of inactivity.

When the control panel is locked, the **KEY LOCK indicator** ❶ lights amber.

To lock or unlock the control panel, press and hold the **KEY LOCK** button for one second or longer.



Notes

Working with menus

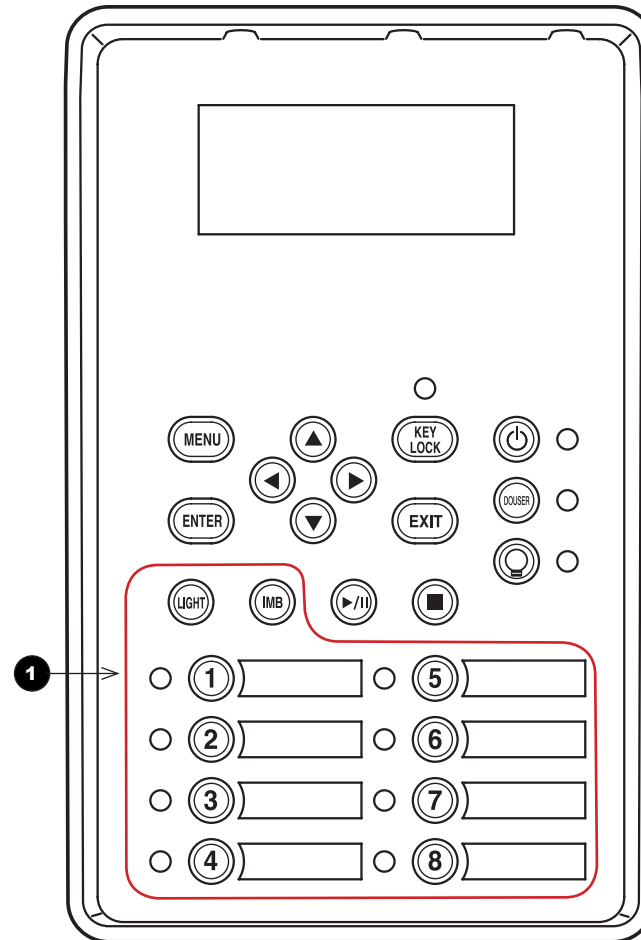
- To access the projector menus, press **MENU**.
- Navigate with the arrow buttons:
 - Press the **UP** button to go above the current menu level.
 - Press the **DOWN** button to go below the current menu level.
 - When more items are available at the current level, go through the list using the **LEFT** and **RIGHT** arrow buttons.
- To select an item, navigate to the item and press **ENTER**.
- To return to the higher level, press **EXIT**.

Entering alphanumeric values

Alphanumeric values are sometimes required, for example when writing the log file to an external memory location via USB.

To enter an alphanumeric character, use **the eight preset buttons, LIGHT and IMB 1**. Each button produces multiple characters. Pressing the button repeatedly cycles through the characters as shown in the table below.

Button	Character
1	A → B → C → 1 → a → b → c → ! ...
2	D → E → F → 2 → d → e → f → " ...
3	G → H → I → 3 → g → h → i → # ...
4	J → K → L → 4 → j → k → l → \$...
5	M → N → O → 5 → m → n → o → % ...
6	P → Q → R → 6 → p → q → r → & ...
7	S → T → U → 7 → s → t → u → ' ...
8	V → W → X → 8 → v → w → x → (...
LIGHT	Y → Z → / → 9 → y → z → ? →) ...
IMB	* → , → . → 0 → ; → : → + → - ...



Advance to the next position using **RIGHT**. Return to the previous position using **LEFT**. Delete the current character value with **DOWN**.

Notes

Using The Projector

Title Select menu

Use this menu to select a title to be projected.

The projector contains a list of up to 100 registered titles. Use this menu to select a title from the list.

To select a title:

1. Open the menu. The **Title Select** menu appears by default.
2. Press DOWN to access the list of available titles.
3. Navigate through the list using the LEFT and RIGHT arrow buttons.
4. Press ENTER to select a title.

Provided the selected title is connected to a signal, the projection should begin immediately.

Selecting a test pattern

1. Navigate to the **TEST Pattern** title on the list.
2. Press DOWN to access the list of test patterns.
3. Press ENTER to select a test pattern.

The selected test pattern should appear on the screen immediately.

Notes

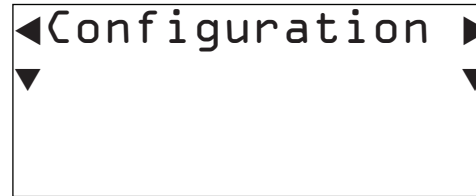


If the title you want to display is assigned a preset button, you can skip the procedure on this page by simply pressing the preset button.

Up to 16 presets can be assigned on the projector. Presets 1 to 8 are recalled by pressing the corresponding preset button. To recall preset 9 to 16, press and hold the UP arrow button, then press the corresponding number button. If, for example, the preset you wish to recall is 9, the corresponding keypad combination is UP + 1. For preset 10, the combination is UP + 2, etc.

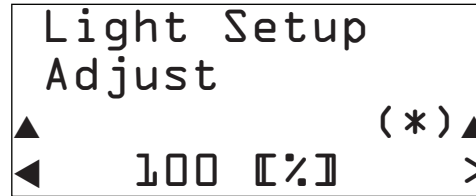
Configuration menu

Press **DOWN** to access various projector settings.



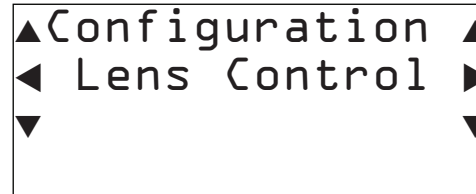
Light Setup

Use this menu to adjust the light output.

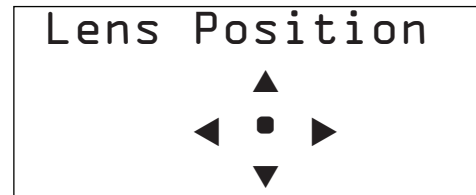


Lens Control

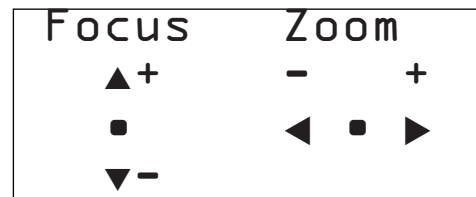
Lens controls are accessed in two modes - **Lens Position** and **Focus Zoom**. Press **ENTER** to switch between the two modes.



- In **Lens Position** mode, use the arrow buttons to shift the lens in the desired direction.



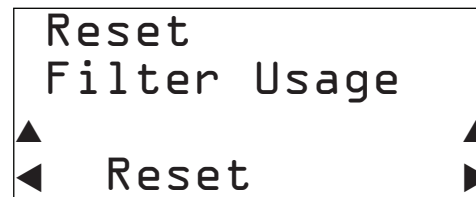
- In **Focus Zoom** mode, use:
 - **UP** and **DOWN** to change the focus,
 - **LEFT** and **RIGHT** to change the zoom.



Reset

This is used to reset the air filter usage time.

Press the ENTER button, then select **Yes** in the displayed confirmation screen, and then press the ENTER button to reset the air filter usage time.



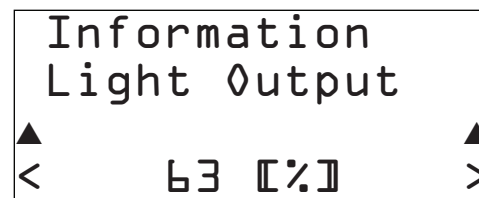
Notes

Information menu

Displays information relating to the light source, the usage time of the projector, the version information and error codes.

Light Output

Displays the value of the Light Output setting as percentage of the maximum light source output.



Preset Button

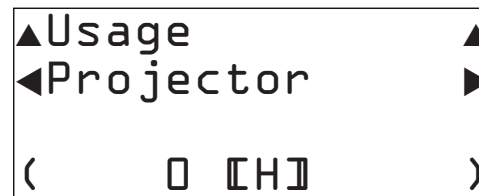
Shows the titles assigned to the sixteen presets stored in the projector's memory.



Usage

Displays information related to the projector usage, such as the usage time of the projector, light source, air filters, and fan, and information about the light source replacement cycle.

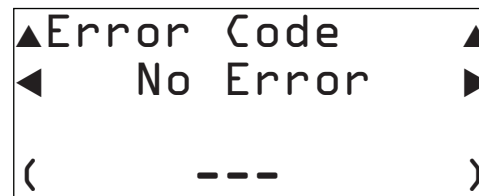
Projector	Displays the usage time of the projector.
Filter	Displays the usage time of the air filters.
Filter Cleaning	Displays the time elapsed since the previous filter cleaning.
Fan	Displays the usage time of the fan.
Light	Display of the usage time of the light source and the value that is displayed is the amount of usage time remaining (approximate).
Light Strike	Displays the number of times the light source has been turned on.
Phosphor	Display of the usage time of the phosphor and the value that is displayed is the amount of usage time remaining (approximate).
Diffuser	Display of the usage time of the diffuser and the value that is displayed is the amount of usage time remaining (approximate).
LCS	Display of the usage time of LCS (Liquid Cooling System) and the value that is displayed is the amount of usage time remaining (approximate).
Douser Count	Displays the number of times the douser has been used.




Error Code

Displays the error code when an error occurs.

When multiple errors occur, you can display them by pressing the **LEFT/RIGHT** buttons.

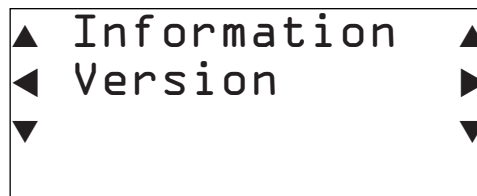


Notes

 The remaining amount displayed in **Light/Phosphor/Diffuser/LCS** is calculated from the current usage time with the unused state as 100% and time to replace as 0%.

Version

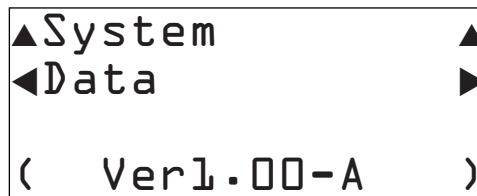
Displays version information about the projector, optional boards, and IMB



System

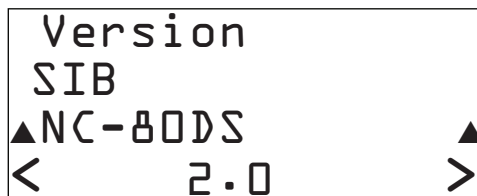
Displays the version information of the projector.

BIOS	Displays the BIOS version of the projector.
Firmware	Displays the firmware version of the projector.
Data	Displays the data version of the projector.
Serial No.	Displays the serial number of the projector.
Model	Displays the model name of the projector.



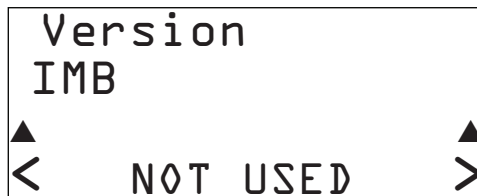
SIB

Displays the model name and version information about the signal input board (SIB). When the projector is in standby mode, the version information displays "---".



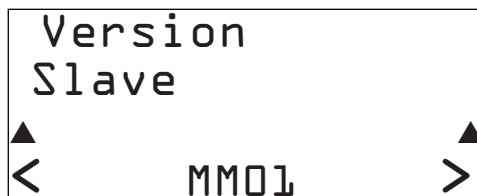
IMB

This item is not available in the current configuration.



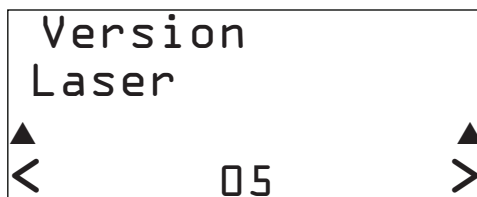
Slave

Displays the slave firmware version of the projector.



Laser

Displays the laser light source firmware version of the projector.



Notes

IP Address

Displays the IP address set up in the projector.

```

▲IP Address ▲
<System *>
( 192.168.10.10 )
    
```

Setup Date

Displays the date when the projector was set up (the starting date of the warranty period).

```

Information
Setup Date
▲ ▲
< 2015/03/03 >
    
```

Option Status

Displays the link status of the device mounted in slot A (media block, signal input board) on the projector. The device name is displayed in () when the projector is in standby or when connection to the device cannot be confirmed.

B	Not Available: Slot B is not available in this projector.
A	Displays the link status of the device in slot A. <ul style="list-style-type: none"> • NC-80DS: Signal input board (NC-80DS01-B) • No Board: No device mounted

```

Information
Option Status
▲ B: Not Avail...▲
< A: NC-80DS >
    
```

Notes



The projector has a default IP address. Access the IP Address page to connect the IP address of the projector to your network. You can later change the IP address using a special software application.

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High Brightness Digital Video Projector

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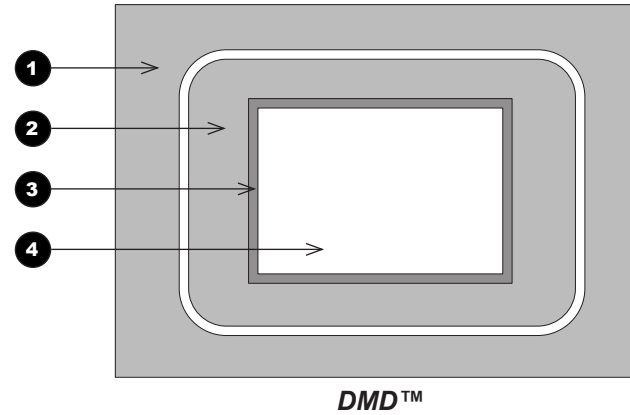
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The DMD™

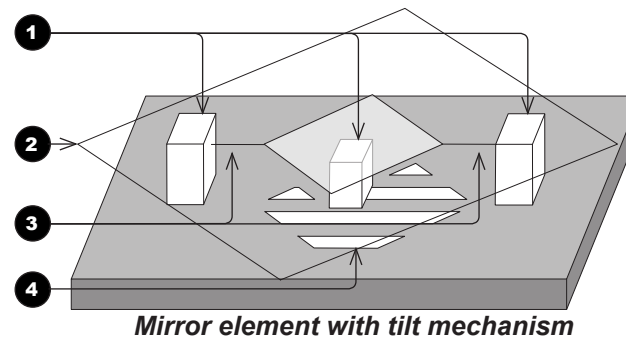
A DMD™ (Digital Micromirror Device™) is a true digital light modulator which utilises an array of approximately 8.8 million moving aluminium mirrors, with each one representing a pixel in the final projected image. The outermost micromirrors in the array remain inactive (*pond of mirrors*) and are not used in constructing the image.

- 1 Casing
- 2 Light shield
- 3 Pond of mirrors
- 4 Array



Each mirror element is suspended over address electrodes by a torsion hinge between two posts.

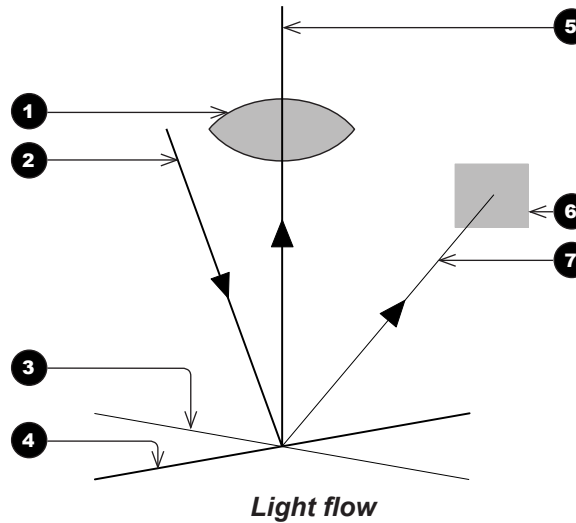
- 1 Support posts
- 2 Mirror element
- 3 Torsion hinges
- 4 Offset address electrode



Notes

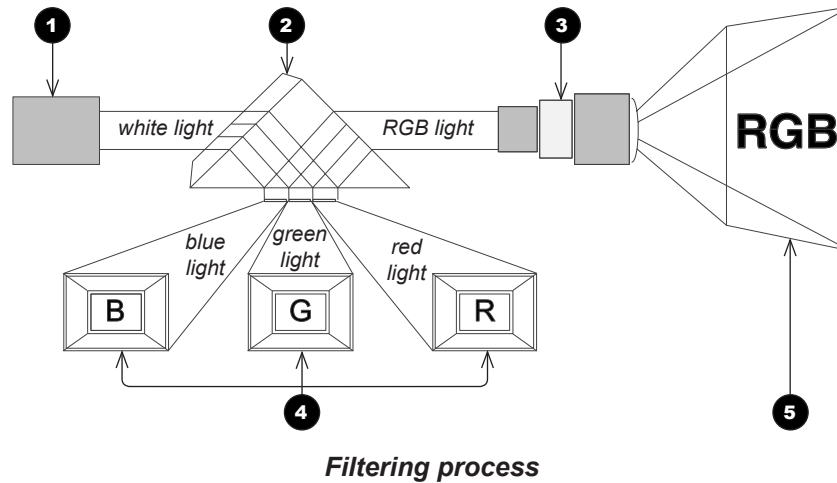
Depending on the voltage polarity applied, each mirror will either tilt to the left to produce a bright pixel or to the right for a dark pixel. When light is applied to the complete DMD™, only the light redirected from a mirror tilting to the left is projected.

- 1 Projection lens
- 2 Incoming light from the illumination module
- 3 Mirror element tilted to the right
- 4 Mirror element tilted to the left
- 5 Reflected light, left tilt
- 6 Light dump
- 7 Reflected light, right tilt



The projector optically filters white light from the illumination module into its constituent red, green and blue. Each color illuminates a separate DMD™ whose modulated output is then recombined with the other two to form the projected full color image.

- 1 Illumination module
- 2 Optical filtering of light into red, green and blue
- 3 Projection lens
- 4 DMD™ devices
- 5 Full color image displayed on screen



Notes

Choosing A Lens


A number of lenses are available. Which lens you choose depends on the screen size, image aspect ratio, throw distance and light output.


The following table shows all available lenses in order of their **throw ratios**:


Throw ratios	Lens extension (±2%)	Throw distance range
0.93 : 1 fixed lens	272 mm (10.7 in)	0.5 m - 40 m (1.6 ft - 130 ft)
1.13 - 1.72 : 1 zoom lens	240 mm (9.4 in)	2.5 m - 40+ m (8.2 ft - 130+ ft) at 1.13:1 0.5 m - 40+ m (1.6 ft - 130+ ft) at 1.72:1
1.65 - 2.60 : 1 zoom lens	210 mm (8.3 in)	3.5 m - 40+ m (11.5 ft - 130+ ft) at 1.65:1 1.0 m - 40+ m (3.3 ft - 130+ ft) at 2.60:1
2.53 - 4.98 : 1 zoom lens	210 mm (8.3 in)	1.5 m - 40+ m (4.9 ft - 130+ ft) at 2.53:1 4.5 m - 40+ m (14.8 ft - 130+ ft) at 4.98:1


To choose a lens, either calculate the **throw ratio** required, or use the **lens charts** provided at the end of this guide.


Notes

 The information on this page applies to version C of the projector. If your projector is an earlier version or if you are unsure which version you have, see [Appendix G](#) at the end of this document.

 INSIGHT 4K zoom lenses are capable of covering throw distances greater than forty metres.

 The minimum throw of the zoom lenses changes depending on the throw ratio used.

 For information about individual lens part numbers, see [Appendix A](#) at the end of this document.

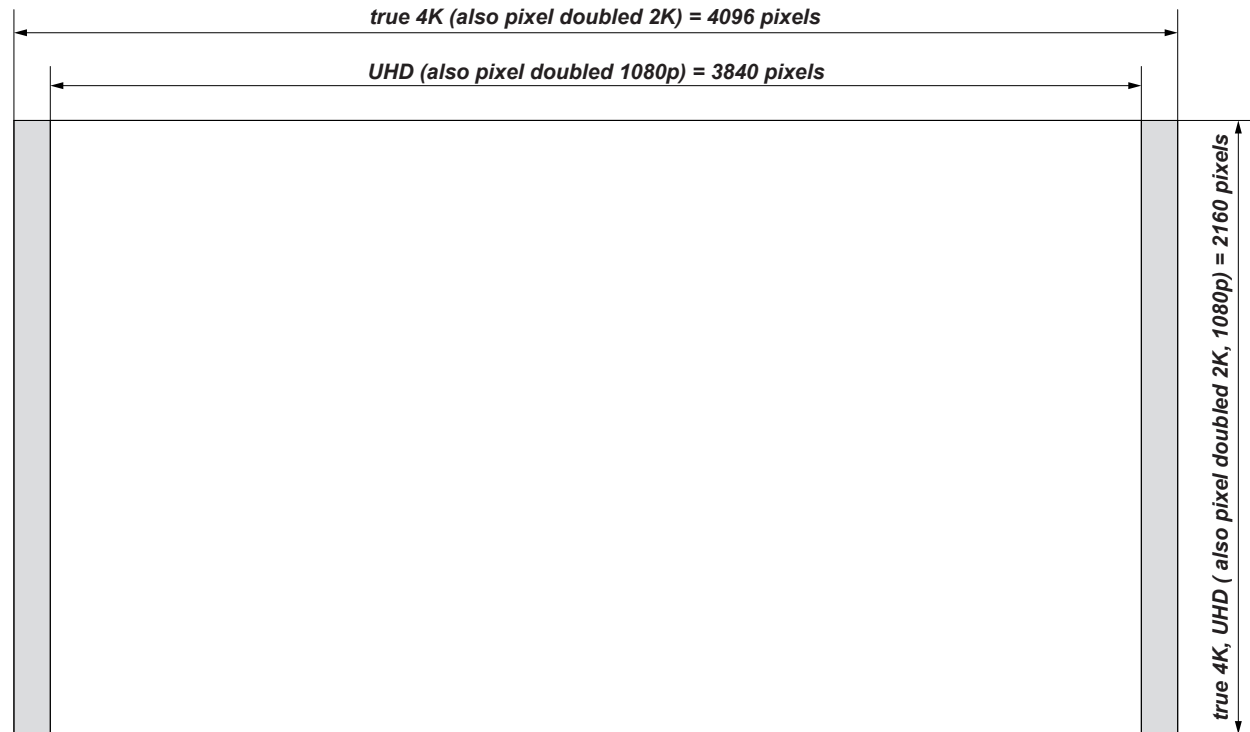
 To choose a lens using lens charts, go to [Appendix B](#) at the end of this document.

Screen Requirements

Fitting the image to the DMD™

The projector supports 4K and Ultra HD formats and is able to achieve 2K and 1080p via frame doubling.

2K and frame doubled 1080p will not utilize the full width of the DMD™, resulting in pillarboxing, as shown in the illustration.



Notes

Diagonal screen sizes

Screen sizes are sometimes specified by their diagonal size (D). When dealing with large screens and projection distances at different aspect ratios, it is more convenient to measure screen width (W) and height (H).

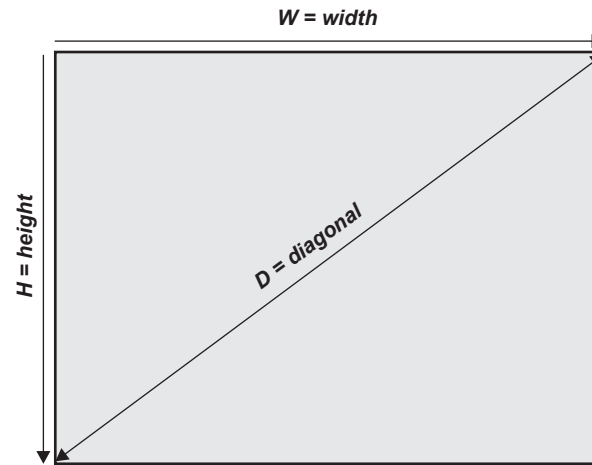
The example calculations below show how to convert diagonal sizes into width and height, at various aspect ratios.

TRUE 4K (approximately 1.9 : 1)

$W = D \times 0.88$ $H = D \times 0.47$

UHD (approximately 1.78 : 1)

$W = D \times 0.87$ $H = D \times 0.49$

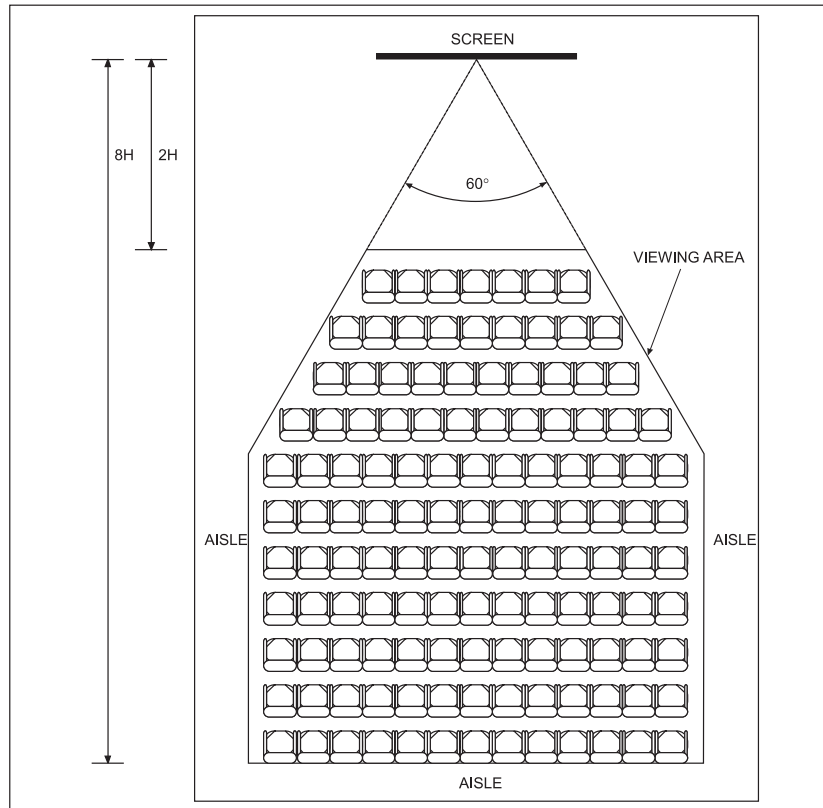
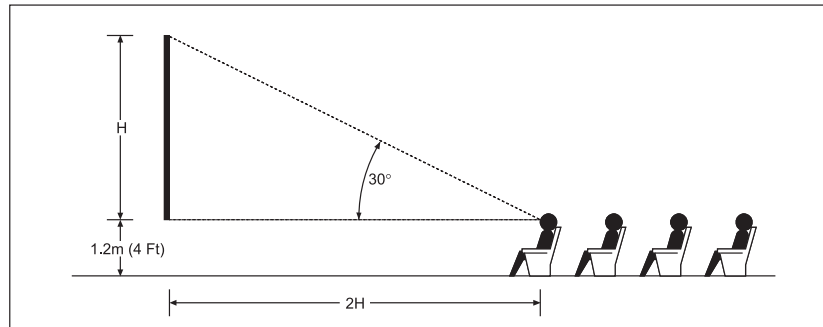


Notes

Positioning the screen and projector

For optimum viewing, the screen should be a flat surface perpendicular to the floor. The bottom of the screen should be 1.2 m (4 feet) above the floor and the front row of the audience should not have to look up more than 30° to see the top of the screen.

The distance between the front row of the audience and the screen should be at least twice the screen height and the distance between the back row and the screen should be a maximum of 8 times the screen height. The screen viewing area should be within a 60° range from the face of the screen.



Notes



The projector should be installed as close to the power outlet as possible.

The power connection should be easily accessible, so that it can be disconnected in an emergency.

Ensure that there is at least 30 cm (12 in) of space between the ventilation outlets and any wall, and 10 cm (4 in) on all other sides.

Do not install the projector close to anything that might be affected by its operational heat, for instance, polystyrene ceiling tiles, curtains etc.



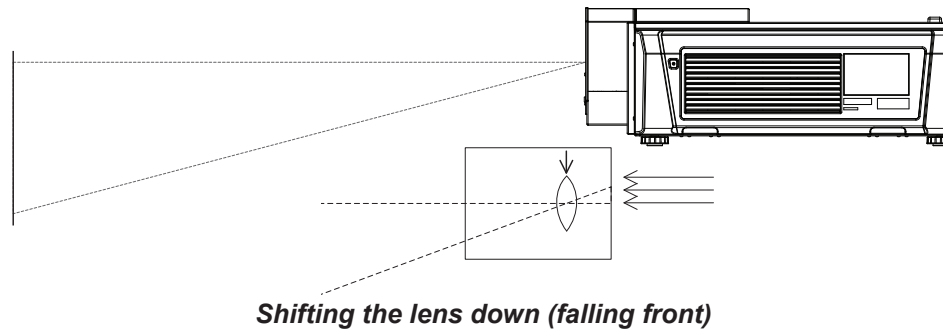
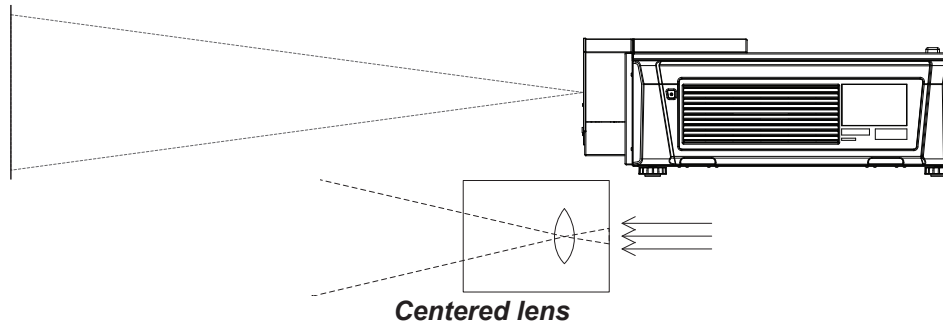
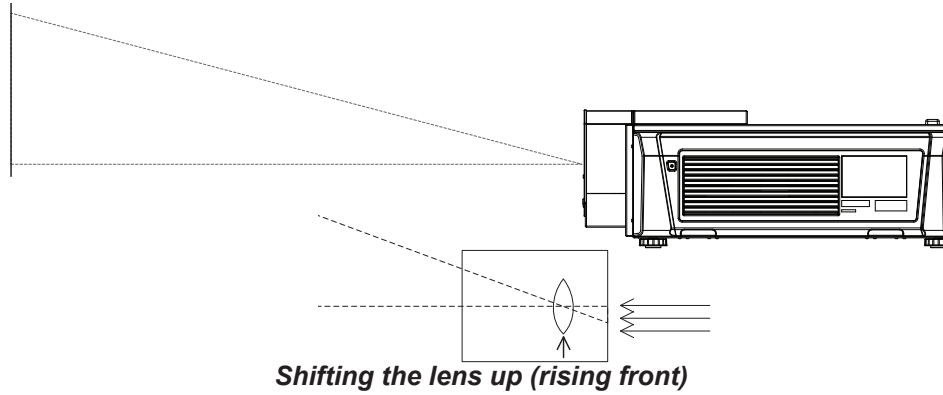
The image can be flipped for rear projection and displayed without the need for extra mirrors or equipment.

However, you must ensure that there is sufficient distance behind the screen for the projector to be correctly located.


Rear installation is generally more complicated and advice should be sought from your local dealer before attempting it.


Positioning The Image

The normal position for the projector is at the centre of the screen. However, you can set the projector above or below the centre, or to one side, and adjust the image using the **Lens shift** feature (known as **rising and falling front**) to maintain a geometrically correct image.



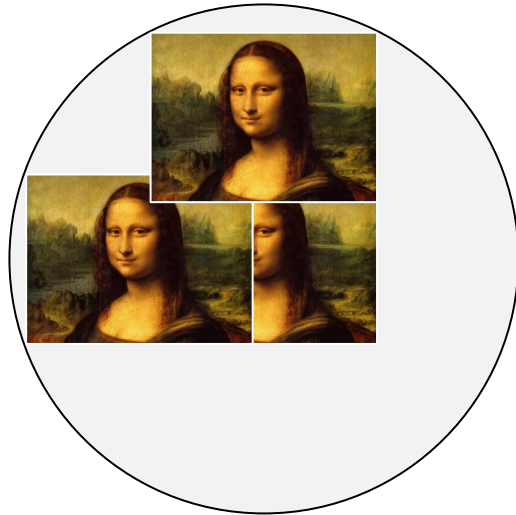
Notes

 For more information on shifting the lens, see [Lens control](#) in the *Operating Guide*.

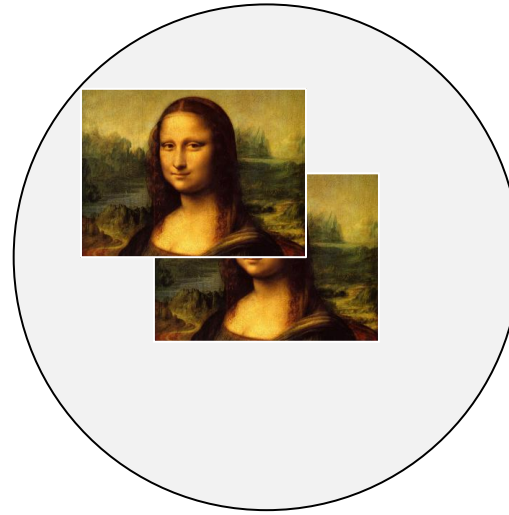
 Whenever possible, position the projector so that the lens is centered for the highest quality image.

Any single adjustment outside the ranges specified on the following page may result in an unacceptable level of distortion, particularly at the corners of the image, due to the image passing through the periphery of the lens optics.

If the lens is to be shifted in two directions combined, the maximum range without distortion will be somewhat less, as can be seen in the illustrations below.




Full horizontal or vertical shift



Combined shift is reduced

Notes


 For more information on shifting the lens, see [Lens control](#) in the **Operating Guide**.


Maximum offset range

The maximum offset range available is dependent on which lens is used. Shifting the lens beyond its undistorted limits may be physically possible, however you may experience excessive vignetting or distortion.

		vertical (frame)	horizontal (frame)
<i>0.93 : 1 fixed</i>		±0.210	±0.080
<i>1.13 - 1.72 : 1 zoom</i>	<i>at 1.13:1</i>	0.340 U 0.190 D	0.085 L 0.100 R
	<i>at 1.72:1</i>	0.500 U 0.190 D	0.150 L 0.180 R
<i>1.65 - 2.60 : 1 zoom</i>	<i>at 1.65:1</i>	0.400 U 0.210 D	0.130 L 0.130 R
	<i>at 2.60:1</i>	0.500 U 0.200 D	0.150 L 0.190 R
<i>2.53-4.98 :1 zoom</i>	<i>at 2.53:1</i>	0.375 U 0.200 D	0.130 L 0.130 R
	<i>at 4.98:1</i>	0.500 U 0.195 D	0.165 L 0.165 R

Notes

 The information on this page applies to version C of the projector. If your projector is an earlier version or if you are unsure which version you have, see [Appendix G](#) at the end of this document.

 For more information on shifting the lens, see [Lens control](#) in the **Operating Guide**.

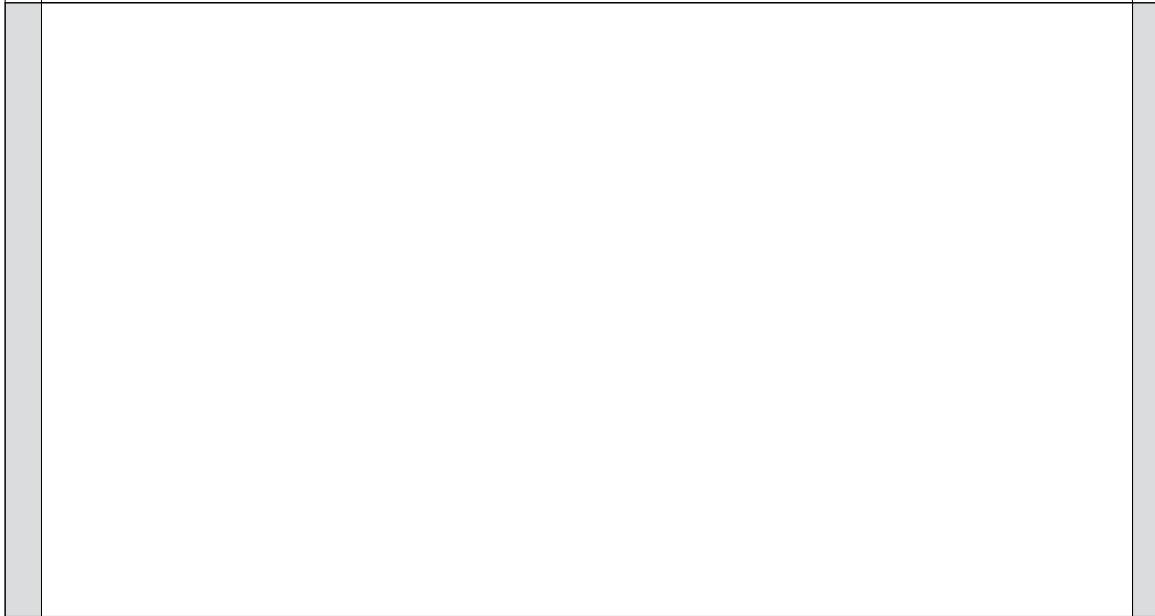
Aspect Ratios Explained

The appearance of a projected image on the screen depends on:

- the DMD™ resolution, which is **4K** with a 4096 x 2160 resolution, corresponding to an aspect ratio of 256:135, or approximately 1.9:1.
- the aspect ratio of the input signal, which is **1.9:1** for 4K and 2K images, or **1.78:1** for UHD or 1080p images.

2K and 1080p are automatically scaled by the projector to fill the height of the DMD™.

The 4K and 2K resolutions have a slightly wider aspect ratio. UHD and scaled 1080p do not fill the width of the DMD™, so they appear centered, with pillarboxing at the sides, as shown in the illustration.



Pillarboxing on UHD and 1080p images

Notes

Appendix A: Lens Part Numbers

Lens	Part No.	Focus Range	Lens Shift	Lens extension
0.93:1 fixed	117-310	0.5 m - 40+ m	Vert: 0.210 (U) 0.210 (D) frame, Hor: 0.08 (L) 0.08 (R)	272 mm
1.13 - 1.72:1 zoom	115-627	At 1.13:1 zoom: 2.5 m - 100+ m	At 1.13:1 zoom: Vert: 0.340 (U) 0.190 (D) frame, Hor: 0.09 (L) 0.09 (R) frame	240 mm
		At 1.72:1 zoom: 0.5 m - 100+ m	At 1.72:1 zoom: Vert: 0.500 (U) 0.190 (D) frame, Hor: 0.16 (L) 0.16 (R) frame	
1.65 - 2.60:1 zoom	115-630	At 1.65:1 zoom: 3.5 m - 100+ m	At 1.65:1 zoom: Vert: 0.400 (U) 0.200 (D) frame, Hor: 0.13 (L) 0.13 (R) frame	210 mm
		At 2.60:1 zoom: 1.0 m - 100+ m	At 2.60:1 zoom: Vert: 0.500 (U) 0.200 (D) frame, Hor: 0.17 (L) 0.17 (R) frame	
2.53 - 4.98:1 zoom	115-632	At 2.53:1 zoom: 1.5 m - 100+ m	At 2.53:1 zoom: Vert: 0.375 (U) 0.200 (D) frame, Hor: 0.13 (L) 0.13 (R) frame	210 mm
		At 4.98:1 zoom: 4.5 m - 100+ m	At 4.98:1 zoom: Vert: 0.500 (U) 0.195 (D) frame, Hor: 0.16 (L) 0.16 (R) frame	

Notes



The information on this page applies to version C of the projector. If your projector is an earlier version or if you are unsure which version you have, see [Appendix G](#) at the end of this document.

Appendix B: Lens Charts

How to use the lens charts

The lens charts on the following pages provide a quick guide to the type of lens needed for a particular projector.

To use the lens charts, you need the following information:

- The distance between the projector and the screen (throw distance)
- The maximum width of your screen

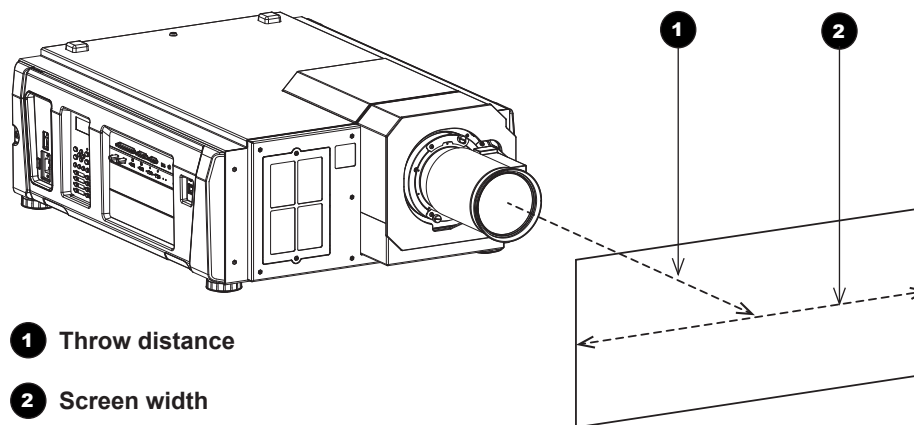
In the chart, find the point where the throw distance corresponds to the screen width, as shown in the example below.

Example

For a projector with

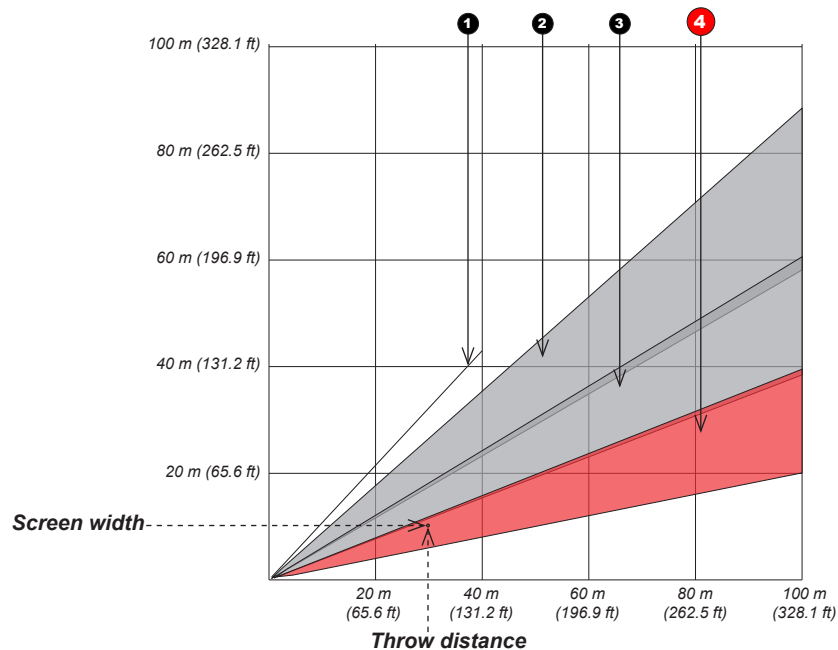
- throw distance 30 m, and
- screen width 9 m,

the correct lens would be **number 4** in the chart.



1 Throw distance

2 Screen width



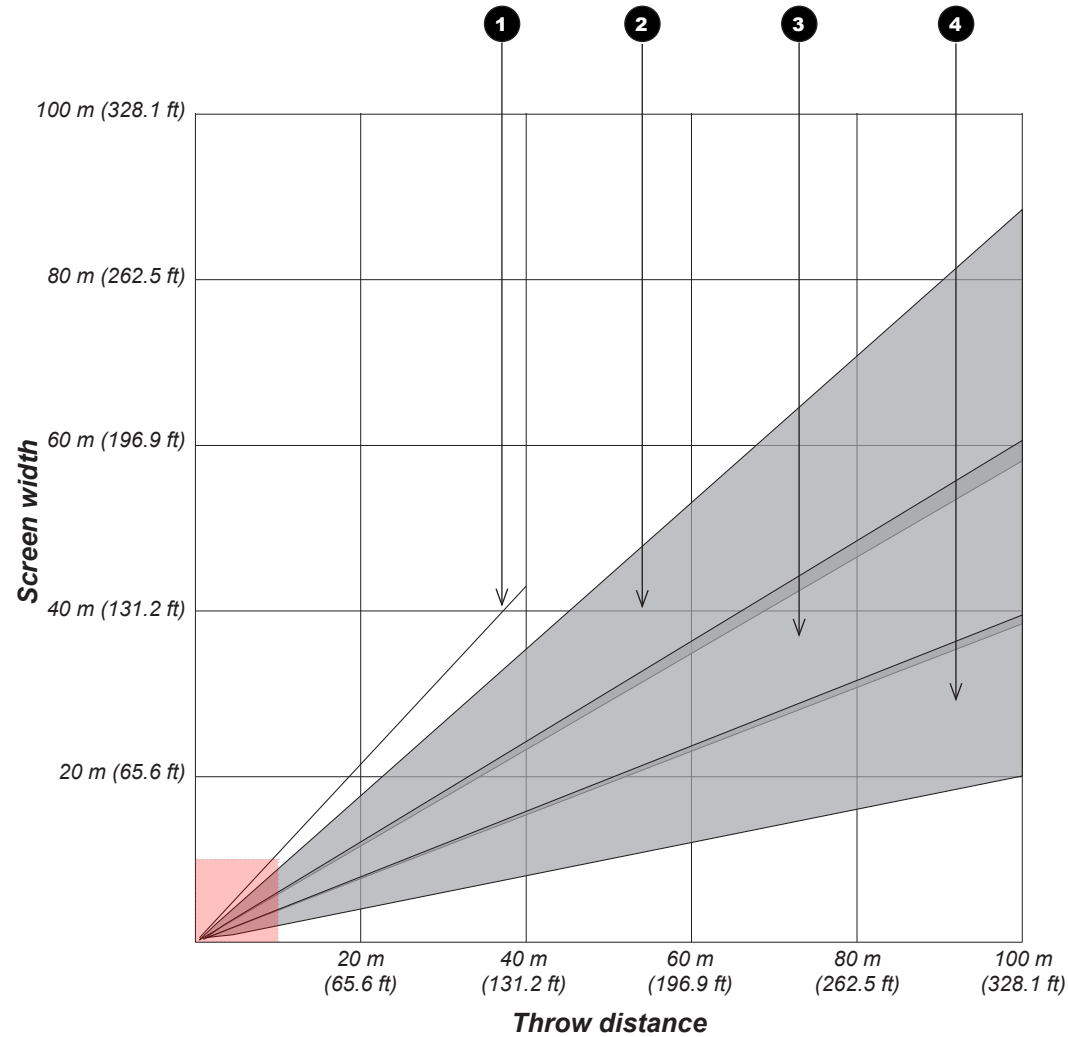
Notes




The information in this section applies to version C of the projector. If your projector is an earlier version or if you are unsure which version you have, see [Appendix G](#) at the end of this document.


Lens chart, up to 100 m throw

- 1** 0.93 : 1 fixed lens
- 2** 1.13-1.72 : 1 zoom lens
- 3** 1.65-2.60 : 1 zoom lens
- 4** 2.53-4.98 : 1 zoom lens



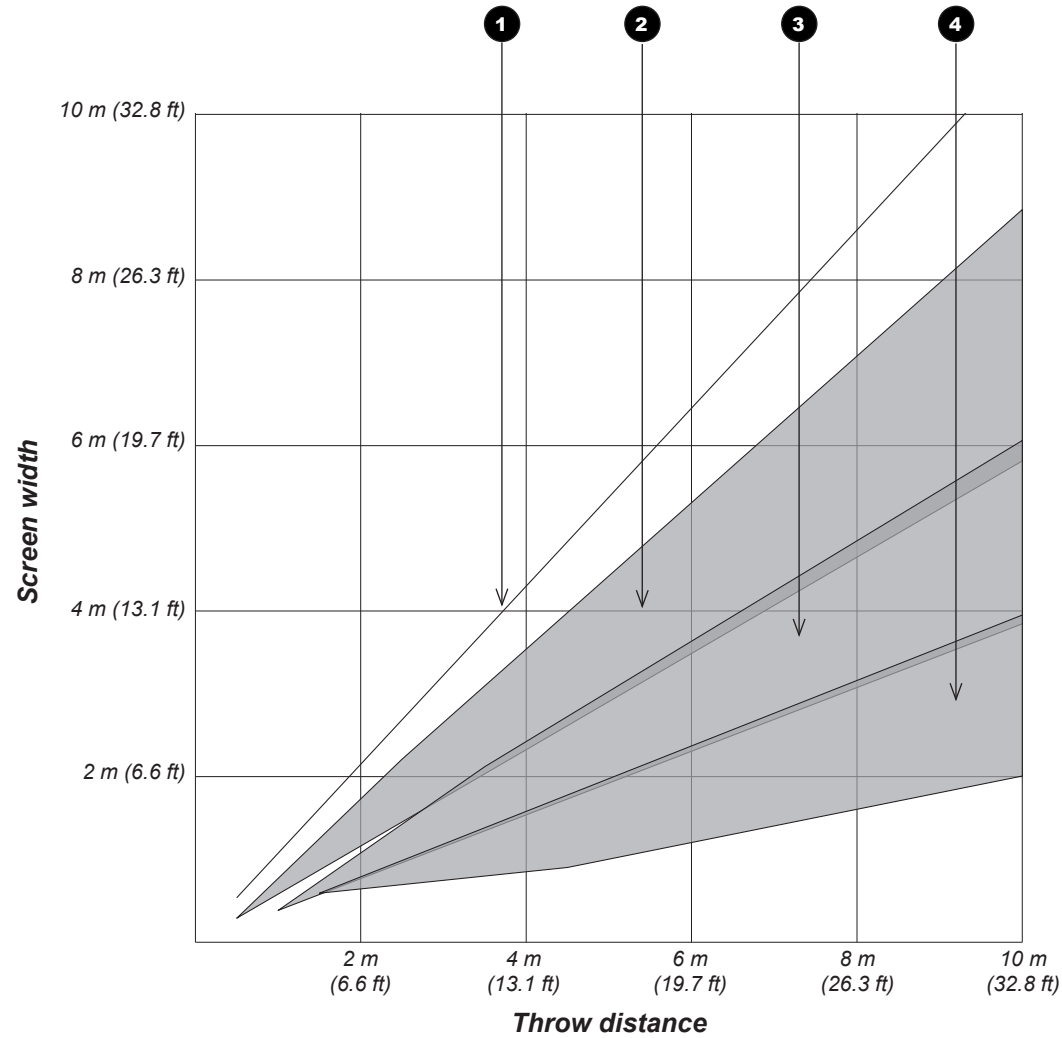
Notes

 The information in this section applies to version C of the projector. If your projector is an earlier version or if you are unsure which version you have, see [Appendix G](#) at the end of this document.

 The semi-transparent red segment at the bottom left corner of the chart is shown on the next page in more detail.

Lens chart, 10 m throw in detail

- 1 0.93 : 1 fixed lens
- 2 1.13-1.72 : 1 zoom lens
- 3 1.65-2.60 : 1 zoom lens
- 4 2.53-4.98 : 1 zoom lens



Notes







The information in this section applies to version C of the projector. If your projector is an earlier version or if you are unsure which version you have, see [Appendix G](#) at the end of this document.


Appendix C: Supported Signal Input Modes


ICP60

	Resolution	Color Model (YCrCb 4:2:0)	Color Model (YCrCb 4:2:2)	Color Model (RGB 4:4:4)	Max allowable Frame Rate Multiplier	Dual-pipe East-West	Dual-pipe Left-Right	3D Capability
HDMI 1.4	720p @ 24 Hz	✓	✓	✓	x 3	—	—	FrameSequential only
	1080p @ 24 Hz	✓	✓	✓	x 3	—	—	
	3840 x 2160 @ 24 Hz	—	✓	✓	x 3	—	—	
	4096 x 2160 @ 24 Hz	—	✓	✓	x 3	—	—	
	720p @ 30 Hz	✓	✓	✓	x 3	—	—	
	1080p @ 30 Hz	✓	✓	✓	x 3	—	—	
	3840 x 2160 @ 30 Hz	—	✓	✓	x 3	—	—	
	720p @ 60 Hz	✓	✓	✓	x 2	—	—	
	1080p @ 50/60 Hz	✓	✓	✓	x 2	—	—	
	1080p @ 120 Hz	—	—	✓	x 1	—	—	
DisplayPort 1.2	720p @ 24 Hz	—	✓	✓	x 3	—	—	
	1080p @ 24 Hz	—	✓	✓	x 3	—	—	
	3840 x 2160 @ 24 Hz	—	✓	✓	x 3	—	—	
	4096 x 2160 @ 24 Hz	—	✓	✓	x 3	—	—	
	720p @ 30 Hz	—	✓	✓	x 3	—	—	
	1080p @ 30 Hz	—	✓	✓	x 3	—	—	
	3840 x 2160 @ 30 Hz	—	✓	✓	x 3	—	—	
	4096 x 2160 @ 30 Hz	—	✓	✓	x 3	—	—	
	720p @ 60 Hz	—	✓	✓	x 2	—	—	
	1080p @ 50/60 Hz	—	✓	✓	x 2	—	—	
	3840 x 2160 @ 50/60 Hz	—	✓	✓	x 2	—	—	
	4096 x 2160 @ 50/60 Hz	—	✓	✓	x 2	—	—	

Notes

-  INSIGHT 4K Laser is capable of exceeding the Rec. 709 gamut.
-  HDMI formats up to 2K are automatically detected and converted to RGB, therefore the projector should be set to RGB. Formats over 2K are passed through to the video processing FPGA in their original color space: please select RGB or YCrCb as appropriate.
-  DisplayPort and HDMI receivers accept deep color and higher depth sources inline with DisplayPort 1.2 and HDMI standards. INSIGHT processing works at up to 12 bits per color (RGB in gamma space) and maps to a displayed palette of 16 bits per color (linear space).
-  Rev B ICP60 is qualified with n-Vidia graphics cards and not guaranteed to work with spread spectrum enabled cards, such as AMD.




Rev C ICP60 onwards has been qualified with both n-Vidia and AMD graphics cards.
-  DisplayPort formats up to 2048x1080 at up to 120 Hz can be accepted. These can be scaled 2:1 to best fit the DMD.

Formats over 2048x1080 can have a maximum input rate of 60 fps and are multiplied in the formatter for 3D.
-  24, 30 and 60 Hz are nominal: the projector also accepts at least 23.98, 25, 48 and 59.84 Hz.

Option board

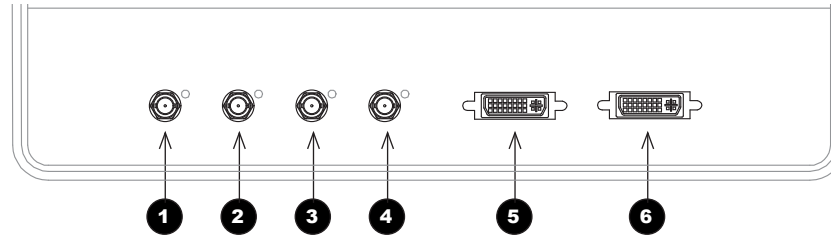
	Resolution	Color Model (YCrCb 4:2:0)	Color Model (YCrCb 4:2:2)	Color Model (RGB 4:4:4)	Frame Rate Multiplier	3D Capability	Comments
DVI (A or B)	720p @ 24 Hz	—	—	✓	x 3	FrameSequential only	3D is of limited use, as there is no 3D sync capability.
	1080p @ 24 Hz	—	—	✓	x 3		
	720p @ 30 Hz	—	—	✓	x 3		
	1080p @ 30 Hz	—	—	✓	x 3		
	720p @ 60 Hz	—	—	✓	x 2		
	1080p @ 60 Hz	—	—	✓	x 2		
Dual DVI (A & B)	3840 x 2160 @ 24 Hz	—	—	✓	x 3	FrameSequential only	3D is of limited use as Dual-pipe is not possible.
	4096 x 2160 @ 24 Hz	—	—	✓	x 3		
	3840 x 2160 @ 30 Hz	—	—	✓	x 3		
	4096 x 2160 @ 30 Hz	—	—	✓	x 3		
Single 3GSDI (A, B, C, or D)	720p @ 24 Hz	✓	✓	—	x 3	FrameSequential only	3D is of limited use as Dual-pipe is not possible in SDI and there is no 3D sync capability.
	1080i @ 24 Hz	✓	✓	—	x 3		
	1080p @ 24 Hz	✓	✓	—	x 3		
	720p @ 30 Hz	✓	✓	—	x 3		
	1080i @ 30 Hz	✓	✓	—	x 3		
	1080p @ 30 Hz	✓	✓	—	x 3		
	720p @ 60 Hz	✓	✓	—	x 2		
	1080i @ 60 Hz	✓	✓	—	x 2		
	1080p @ 60 Hz	✓	✓	—	x 2		
Dual 3GSDI (A & B or C & D)	3840 x 2160 @ 24 Hz	✓	✓	—	x 3	FrameSequential only	
	4096 x 2160 @ 24 Hz	✓	✓	—	x 3		
	3840 x 2160 @ 30 Hz	✓	✓	—	x 3		
	4096 x 2160 @ 30 Hz	✓	✓	—	x 3		
Quad HDSDI (A, B, C, & D)	3840 x 2160 @ 60 Hz	✓	✓	—	x 2	FrameSequential only	
	4096 x 2160 @ 60 Hz	✓	✓	—	x 2		

Notes

-  3G-SDI is Level B only.
-  4K interlaced signal is not supported by ICP.
-  INSIGHT 4K Laser will accept a single option card.

Screen allocation of Option board input signals

- 1** 3G-SDI A
- 2** 3G-SDI B
- 3** 3G-SDI C
- 4** 3G-SDI D
- 5** DVI A
- 6** DVI B




		<i>3840</i>			<i>4096</i>	
SDI Quad	<i>2160</i>	SDI A: 1920 x 1080	SDI B: 1920 x 1080	<i>2160</i>	SDI A: 2048 x 1080	SDI B: 2048 x 1080
		SDI C: 1920 x 1080	SDI D: 1920 x 1080		SDI C: 2048 x 1080	SDI D: 2048 x 1080
		<i>3840</i>			<i>4096</i>	
DVI Twin	<i>2160</i>	DVI A: 1920 x 2160 DVI B: 1920 x 2160		<i>2160</i>	DVI A: 2048 x 2160 DVI B: 2048 x 2160	


Notes

Appendix D: Menu Map

Menu	Sub Menus	Description
TITLE SELECT		
	Title Memory Name	Selects the title of the signal to be projected.
	Test Pattern	Selects a test pattern to be projected.
CONFIGURATION		
	Light Setup	
	Adjust	Adjusts the light source brightness (output).
	Lens Control	
	Lens Position	Adjusts the position of the projected image.
	Focus Zoom	Adjusts the size and focus of the projected image.
	Reset	
	(Factory Default)	Returns the settings to their default values.
	Filter Usage	Selects between preset buttons and titles only, LAN settings and all settings.
	Filter Cleaning	Initializes the usage time of the air filter.
	(Fan Usage)	Initializes the filter cleaning time.
	(Light Usage)	Initializes the usage time of the fan.
	(Phosphor)	Initializes the usage time of the light source.
	(Diffuser)	Initializes the usage time of the phosphor.
	(LCS)	Initializes the usage time of the diffuser.
	(Douser Count)	Initializes the usage time of the liquid cooling system.
	(Setup)	Resets the number of times the douser has been used.
	(Installation)	This menu is inaccessible from the control panel.
	(Memory)	
(TITLE SETUP)		

Notes



 Some of the information in this menu map is summarised. See the actual menu on the projector for full details.

 Menus and menu items displayed in parentheses cannot be accessed from the control panel.

To access such items, you need to connect the projector to a computer running a specially designed application. The software will require special login credentials.

Menu	Sub Menus	Description
INFORMATION	Light Output	Displays the light source output setting.
	Lens Type	Displays the lens type setting.
	Preset Button	
	Preset Button 1 - 16	Displays the titles assigned to the preset buttons (<1> to <8>).
	Usage	Displays information related to projector usage.
	Error Code	Displays any currently occurring error.
	Version	
	System	Displays model name and version information about the projector.
	SIB	Displays model and version of the signal input board (SIB).
	Slave	Displays the slave firmware version of the projector.
	Laser	Displays the laser light source firmware version of the projector.
	IP Address	
	System	Displays the IP address of the projector.
Setup Date	Displays the date when the projector was set up (starting date of the warranty period).	
Option Status	Displays the link status of the device mounted in slot A and projector	

Notes

-  *Some of the information in this menu map is summarised. See the actual menu on the projector for full details.*
-  *Menus and menu items displayed in parentheses can only be accessed by service personnel.*

Appendix E: Wiring Details

Signal inputs - main connections panel

HDMI

19 way type A connector

- 1 TMDS Data 2+
- 2 TMDS Data 2 Shield
- 3 TMDS Data 2-
- 4 TMDS Data 1+
- 5 TMDS Data 1 Shield
- 6 TMDS Data 1-
- 7 TMDS Data 0+
- 8 TMDS Data 0 Shield
- 9 TMDS Data 0-
- 10 TMDS Clock+
- 11 TMDS Clock Shield
- 12 TMDS Clock-
- 13 CEC
- 14 not connected
- 15 SCL (DDC Clock)
- 16 SCA (DDC Data)
- 17 DDC/CEC Ground
- 18 +5 V Power
- 19 Hot Plug Detect



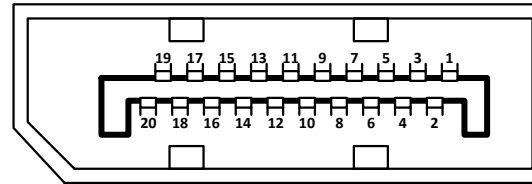
HDMI: pin view of panel connector

Notes

DisplayPort

DisplayPort 1.2

Pin 1	ML_Lane 0 (p)	Lane 0 (positive)
Pin 2	GND	Ground
Pin 3	ML_Lane 0 (n)	Lane 0 (negative)
Pin 4	ML_Lane 1 (p)	Lane 1 (positive)
Pin 5	GND	Ground
Pin 6	ML_Lane 1 (n)	Lane 1 (negative)
Pin 7	ML_Lane 2 (p)	Lane 2 (positive)
Pin 8	GND	Ground
Pin 9	ML_Lane 2 (n)	Lane 2 (negative)
Pin 10	ML_Lane 3 (p)	Lane 3 (positive)
Pin 11	GND	Ground
Pin 12	ML_Lane 3 (n)	Lane 3 (negative)
Pin 13	CONFIG1	connected to Ground1)
Pin 14	CONFIG2	connected to Ground1)
Pin 15	AUX CH (p)	Auxiliary Channel (positive)
Pin 16	GND	Ground
Pin 17	AUX CH (n)	Auxiliary Channel (negative)
Pin 18	Hot Plug	Hot Plug Detect
Pin 19	Return	Return for Power
Pin 20	DP_PWR	Power for connector (3.3 V 500 mA)



DisplayPort: pin view of panel connector

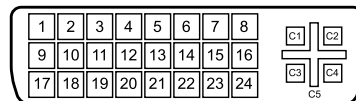
Notes

Signal inputs - option board

DVI


24 way D-type connector


Pin 1	TMDS data 2-	Digital red- (link 1)
Pin 2	TMDS data 2+	Digital red+ (link 1)
Pin 3	TMDS data 2/4 shield	
Pin 4	TMDS data 4-	Digital green- (link 2)
Pin 5	TMDS data 4+	Digital green+ (link 2)
Pin 6	DDC clock	
Pin 7	DDC data	
Pin 8	Analog vertical sync	
Pin 9	TMDS data 1-	Digital green- (link 1)
Pin 10	TMDS data 1+	Digital green+ (link 1)
Pin 11	TMDS data 1/3 shield	
Pin 12	TMDS data 3-	Digital blue- (link 2)
Pin 13	TMDS data 3+	Digital blue+ (link 2)
Pin 14	+5 V	Power for monitor when in standby
Pin 15	Ground	Return for pin 14 and analog sync
Pin 16	Hot plug detect	
Pin 17	TMDS data 0-	Digital blue- (link 1) and digital sync
Pin 18	TMDS data 0+	Digital blue+ (link 1) and digital sync
Pin 19	TMDS data 0/5 shield	
Pin 20	TMDS data 5-	Digital red- (link 2)
Pin 21	TMDS data 5+	Digital red+ (link 2)
Pin 22	TMDS clock shield	
Pin 23	TMDS clock+	Digital clock+ (links 1 and 2)
Pin 24	TMDS clock-	Digital clock- (links 1 and 2)
C1	Analog red	
C2	Analog green	
C3	Analog blue	
C4	Analog horizontal sync	
C5	Analog ground	Return for R, G, and B signals



DVI: pin view of female connector

Notes

 The default hardware configuration does not include an option board, which can be ordered separately.

 High-bandwidth Digital Content Protection (HDCP) is supported on this input.

3G-SDI In
75 ohm BNC



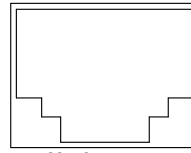
3G-SDI connector

Notes

Control connections

LAN

RJ45 socket

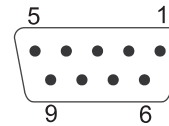


Update port

RS232


9 way D-type connector

Pin No.	RS-232C Signal Name	Functions as RS-232C	Projector Connector Operation
1	CD	Carrier detection	Not used (N.C.)
2	RXD	Reception data	Data transmission to an external device
3	TXD	Transmission data	Data reception from an external device
4	DTR	Data Terminal ready (Note)	Connection to 6 pins
5	GND	Signal GND	Signal GND
6	DSR	Data set ready (Note)	Connection to 4 pins
7	RTS	Transmission request	SYSTEM: Hi-Z (Not used) CINEMA: Hi-Z (Used)
8	CTS	Transmission available	SYSTEM: Fixed at -6.5 V (Not used) CINEMA: ±10.5 V (Used: Depends on communication status)
9	RI	Ring indicator	Not used (N.C.)



RS232:
pin view of female connector

Notes

 Only one remote connection (RS232 or LAN) should be used at any one time.

3D Sync IN and 3D Sync OUT

75 ohm BNC



pin view of female connector

Appendix F: Glossary Of Terms

1080p

An [HDTV resolution](#) which corresponds to 1920 x 1080 [pixels](#) (a widescreen [aspect ratio](#) of 16:9).

3D active glasses

Wireless battery-powered glasses with LCD shutters. Synchronization information is communicated to the glasses by means of an infrared (IR) or radio frequency (RF) emitter which is connected to the Sync Out terminal on the projector. IR or RF pulses are transmitted by the emitter to signal when the left eye and right eye images are being displayed. The glasses incorporate a sensor which detects the emitter's signal and synchronises the left and right eye shutters with the projected image.

3D passive glasses

Passive glasses do not require a power source to work. Light with left-hand polarisation can pass through the left lens and light with right-hand polarisation can pass through the right-hand lens. These glasses are used in conjunction with another device which polarizes the image, such as a [ZScreen](#).

Adjust lines

A pattern applied to the image where its edge is to be blended with another image. Adjust lines are used to position the projectors in the array during the [edge blend](#) process.

Anamorphic lens

A special lens which, when used with the *TheaterScope* [aspect ratio](#), allows watching 2.35:1 content packed in a 16:9 source.

Aperture

The opening of the lens that determines the angle through which light travels to come into focus.

Notes

Aspect ratio

The proportional relationship between the width and the height of the projected image. It is represented by two numbers separated by a colon, indicating the ratio of image width and height respectively: for example, 16:9 or 2.35:1.

Not to be confused with [resolution](#).

Blanking (projection)

The ability to intentionally turn off, that is, set to black, areas around the edges of the projected image. It is sometimes referred to as “curtains” since it can be used to blank an area of image that literally falls on the curtains at the side of the screen in a movie theater. Usually no image resizing or geometric correction takes place and the “blanked” part of the image is lost.

Not to be confused with horizontal and vertical [blanking \(video signal\)](#).

Blanking (video signal)

The section of the video signal where there is no active video data.

Not to be confused with [blanking \(projection\)](#).

Blend region

The area of the image that is to overlap with another image in an [edge blend](#) setup. Sometimes called *overlapping region*.

Brightness (electronic control)

A control which adds a fixed intensity value to every [pixel](#) in the display, moving the entire range of displayed intensities up or down, and is used to set the black point in the image (see [Contrast](#)).

Brightness (optical)

Describes how ‘bright’ an image that is projected onto a screen appears to an observer.

Color gamut

The spectrum of color available to be displayed.

Notes

Color temperature

The position along the black body curve on the chromaticity diagram, normally quoted in Kelvin. It takes into account the preset values for color balance in the service set-up to take up the variations in the prism. The projector allows you to adjust this temperature (i.e. adjust the picture color temperature).

Contrast (electronic control)

The adjustment of the white point of the image without affecting the black point. This increases the intensity range of the displayed image.

Contrast (optical)

The intensity difference between the darkest and lightest areas of the screen.

Crop

Remove part of the projected image.

Alternatively, fit an image into a frame with a different [aspect ratio](#) by removing part of the image. The image is resized so that either its length or its width equals the length or width of the frame, while the other dimension has moved outside the frame; the excess area is then cut out.

Dark time

The time inserted between [frames](#) when using [3D active glasses](#), to avoid [ghosting](#) caused by switching time between left and right eye.

DDC (Display Data Channel)

A communications link between the source and projector. DDC is used on the HDMI, DVI and VGA inputs. The link is used by the source to read the [EDID](#) stored in the projector.

Deinterlacing

The process of converting [interlaced](#) video signals into [progressive](#) ones.

Notes

DHCP (Dynamic Host Configuration Protocol)

A network protocol that is used to configure network devices so that they can communicate on an IP network, for example by allocating an IP address.

DMD™ (Digital Micromirror Device™)

The optical tool that transforms the electronic signal from the input source into an optical image projected on the screen. The DMD™ of a projector has a fixed [resolution](#), which affects the [aspect ratio](#) of the projected image.

A Digital Micromirror Device™ (DMD™) consists of moving microscopic mirrors. Each mirror, which acts as a [pixel](#), is suspended between two posts by a thin torsion hinge. It can be tilted to produce either a bright or dark pixel.

Edge blend

A method of creating a combined image by blending the adjoining edges of two or more individual images.

Edge tear

An artifact observed in [interlaced video](#) where the screen appears to be split horizontally. Edge tears appear when the video feed is out of sync with the refresh rate of the display device.

EDID (Extended Display Identification Data)

Information stored in the projector that can be read by the source.

EDID is used on the HDMI, DVI and VGA inputs, allowing the source to automatically configure to the optimum display settings.

EDTV (Enhanced Definition Television)

A [progressive](#) digital television system with a lower resolution than [HDTV](#).

Field

In [interlaced video](#), a part of the image [frame](#) that is scanned separately. A field is a collection of either all the odd lines or all the even lines within the frame.

Notes

Frame

One of the many still images displayed in a sequence to create a moving picture. A frame is made of horizontal lines of **pixels**. For example, a 1920x1080 frame consists of 1080 lines, each containing 1920 pixels. In analog video frames are scanned one at a time (**progressive scanning**) or split into **fields** for each field to be scanned separately (**interlaced video**).

Frame rate

The number of **frames** shown per second (fps). In TV and video, a frame rate is the rate at which the display device scans the screen to “draw” the frame.

Frame rate multiplication

To stop low **frame rate** 3D images from flickering, frame rate multiplication can be used, which increases the displayed frame rate by two or three times.

Gamma

A nonlinear operation used to code and decode **luminance**. It originates from the Cathode Ray Tube technology used in legacy television sets.

Ghosting

An artifact in 3D image viewing. Ghosting occurs when an image intended for one eye is partially seen by the other eye.

Ghosting can be removed by optimizing the **dark time** and sync delay.

HDCP (High-bandwidth Digital Content Protection)

An encryption scheme used to protect video content.

HDTV (High Definition Television)

A television system with a higher **resolution** than **SDTV** and **EDTV**. It can be transmitted in various formats, notably **1080p** and 720p.

Hertz (Hz)

Cycles per second.

Notes

Horizontal Scan Rate

The rate at which the lines of the incoming signal are refreshed. The rate is set by the horizontal [synchronization](#) from the source and measured in [Hertz](#).

Hs + Vs

Horizontal and vertical [synchronization](#).

Interlacing

A method of updating the image. The screen is divided in two [fields](#), one containing every odd horizontal line, the other one containing the even lines. The fields are then alternately updated. In analog TV interlacing was commonly used as a way of doubling the refresh rate without consuming extra bandwidth.

Interleaving

The alternation between left and right eye images when displaying 3D.

LED (Light Emitting Diode)

An electronic component that emits light.

Letterboxing

Black margins at the top and bottom of the image. Letterboxing appears when a wider image is packed into a narrower [frame](#) without changing the original [aspect ratio](#).

Lumen

A photometric unit of radiant power. For projectors, it is normally used to specify the total amount of emitted visible light.

Noise

Electrical interference displayed on the screen.

Notes

Overlapping region

See [blend region](#).

Pillarboxing

Black margins at the left and right of the image. Pillarboxing appears when a narrower image is packed into a wider [frame](#) without changing the [aspect ratio](#).

Pixel

Short for *Picture Element*. The most basic unit of an image. Pixels are arranged in lines and columns. Each pixel corresponds to a micromirror within the [DMD™](#); resolutions reflect the number of pixels per line by the number of lines. For example, a [1080p](#) projector contains 1080 lines, each consisting of 1920 pixels.

Pond of mirrors

Area around the periphery of the [DMD™](#) containing inactive mirrors. The pond of mirrors may cause artifacts, for example during the [edge blending](#) process.

Primary colors

Three colors any two of which cannot be mixed to produce the third. In additive color television systems the primary colors are red, green and blue.

Progressive scanning

A method of updating the image in which the lines of each [frame](#) are drawn in a sequence, without [interlacing](#).

Pulldown

The process of converting a 24 fps film footage to a video [frame rate](#) (25 fps for *PAL/SECAM*, 30 fps for *NTSC*) by adding extra [frames](#). DP projectors automatically carry out reverse pulldown whenever possible.

Resolution

The number of [pixels](#) in an image, usually represented by the number of pixels per line and the number of lines (for example, 1920 x 1200).

Notes

RGB (Red, Green and Blue)

An uncompressed [Component Video](#) standard.

Scope

An [aspect ratio](#) of 2.35:1.

Synchronization

A timing signal used to coordinate an action.

Test pattern

A still image specially prepared for testing a projection system. It may contain various combinations of colors, lines and geometric shapes.

Throw distance

The distance between the screen and the projector.

Throw ratio

The ratio of the [throw distance](#) to the screen width.

TRC (Throw ratio correction)

A special number used in calculating [throw distances](#) and [throw ratios](#) when the image does not fill the width of the [DMD™](#).

TRC is the ratio of the [DMD™ aspect ratio](#) to the image source aspect ratio:

$$TRC = \frac{DMD^{\text{TM}} \text{ aspect ratio}}{\text{Source aspect ratio}}$$

TRC is only used in calculations if it is greater than 1.

Notes

Vertical Scan Rate

The rate at which the frames of the incoming signal are refreshed. The rate is set by the vertical synchronization from the source and measured in Hertz.

Vignetting

Optical cropping of the image caused by the components in the projection lens. This can happen if too much offset is applied when positioning the image using the lens mount.

ZScreen

A special kind of light modulator which polarizes the projected image for 3D viewing. It normally requires that images are projected onto a silver screen. The ZScreen is placed between the projector lens and screen. It changes the polarization of the projected light and switches between left- and right-handed circularly polarized light at the field rate.

Notes

Appendix G: Earlier Versions

This section contains information that is relevant to earlier versions of the projector and not relevant to the latest version.

Use the information in this section if you have an earlier version of INSIGHT 4K Laser.

The latest version of INSIGHT 4K Laser is C. If your projector is version A or B, then the information in this section is for you.

How to check the version of your projector

The **version** ¹ of your projector is recorded on the product label on the side of the projector, next to the part number, as shown in the illustration below.



Notes

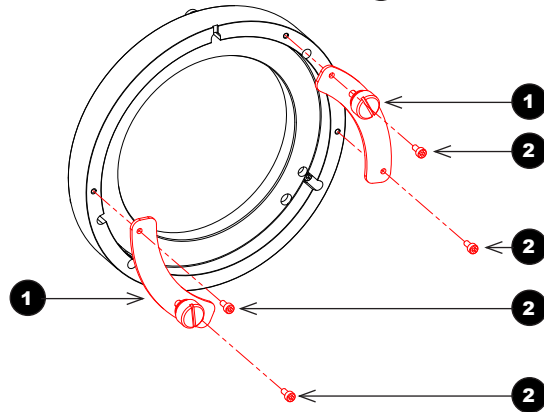
Lens assembly and fitting

Assembling the lens

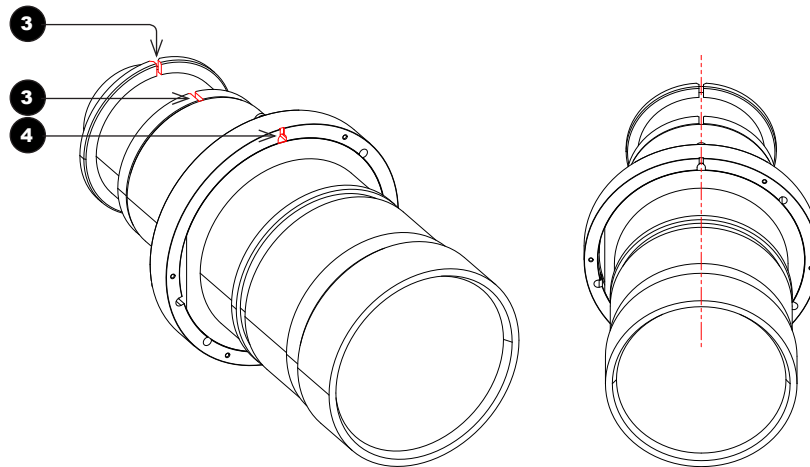
Assembling the lens is the process of fitting the lens holder and motor cover to the lens. If your lens already has these parts fitted, skip this procedure.

To assemble the lens:

1. Detach the **retaining plates** **1** from the lens holder.
Use a 2.5 mm Allen key to remove the **M3 socket head screws** **2**.



2. Insert the lens into the lens holder. Align **the notches on the lens** **3** with **the notch on the holder** **4**.



Notes



Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the lens, avoid using excessive force as this may damage the equipment.

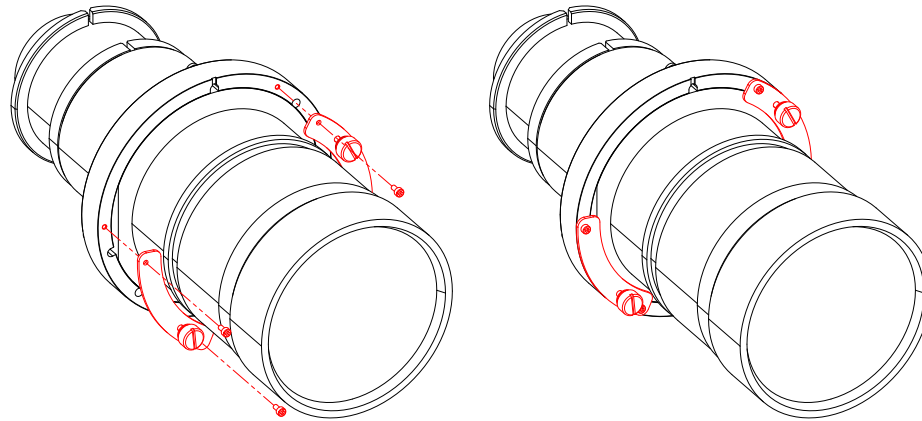


Take care to preserve the original lens packaging and protective caps for future use.

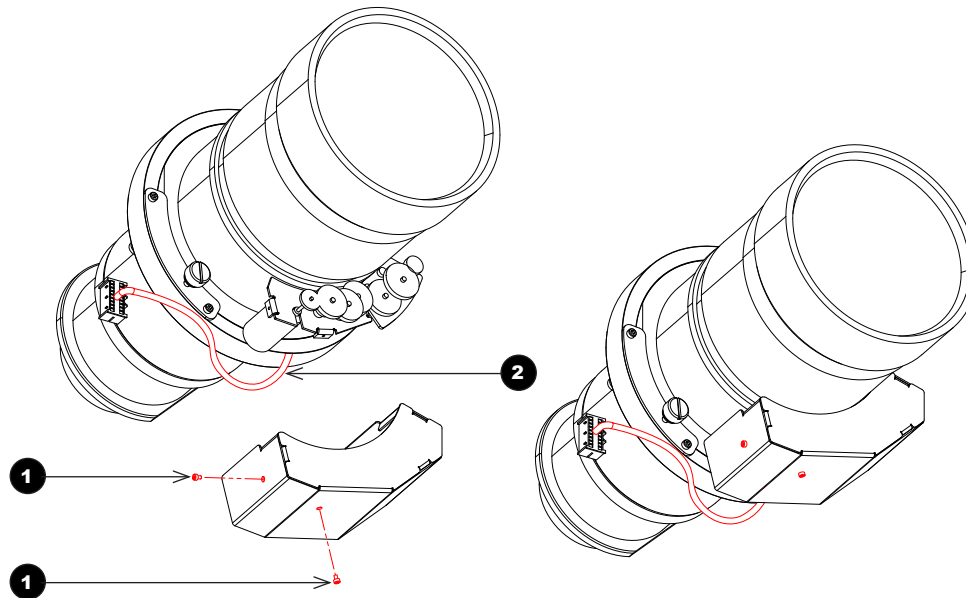


The projector will not power on without the lens fitted.

3. Keeping the lens and holder aligned, secure the retaining plates removed earlier.



4. Attach the motor cover using the two **M2 socket head screws 1** provided. Ensure **the connector cable 2** is not trapped.



Notes



Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the lens, avoid using excessive force as this may damage the equipment.



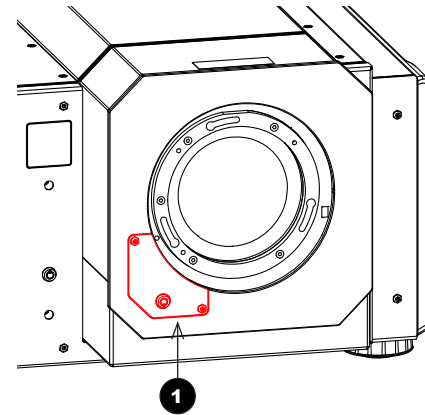
Take care to preserve the original lens packaging and protective caps for future use.



The projector will not power on without the lens fitted.

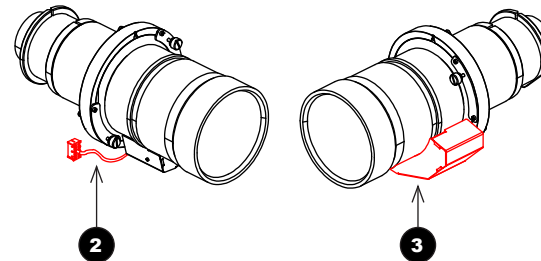
Inserting a new lens

1. Remove the **connector cover** **1**; it is held in position by two screws and a key.



2. Position the lens so that, if viewed from the front:

- the **control cable** **2** is on the left
- the **motor cover** **3** is on the right

**Notes**

Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the lens, avoid using excessive force as this may damage the equipment.

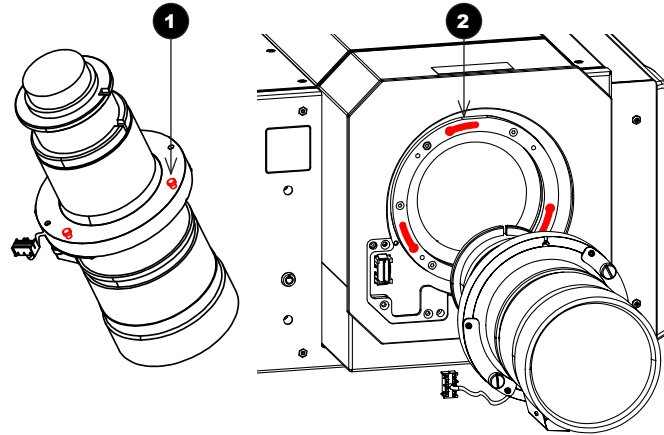


Take care to preserve the original lens packaging and protective caps for future use.

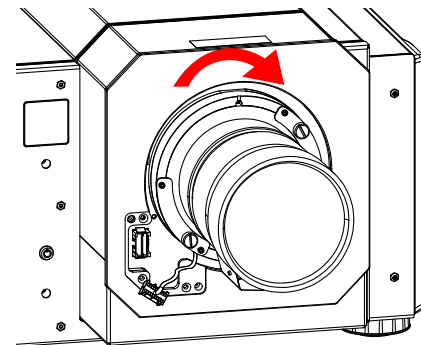


The projector will not power on without the lens fitted.

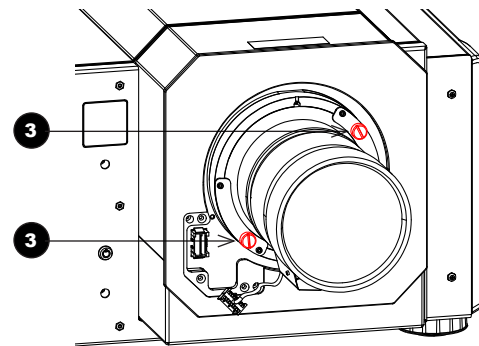
3. Insert the lens into the mount.
Engage the three **locating studs** **1** into the corresponding **slots** **2** on the mount.







4. Rotate the lens clockwise until the studs slide all the way into the slots.



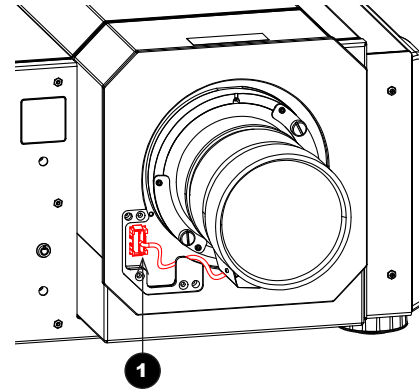
5. Tighten the two **fixing screws** **3** on the lens holder.



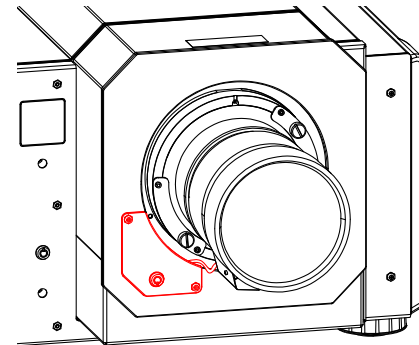
Notes

-  Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.
-  When changing the lens, avoid using excessive force as this may damage the equipment.
-  Take care to preserve the original lens packaging and protective caps for future use.
-  The projector will not power on without the lens fitted.

6. Insert the control cable plug into the **connector socket 1**. Place the excess wire behind the front cover of the projector.



7. Replace the connector cover, making sure the cable is not trapped.



Notes



Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the lens, avoid using excessive force as this may damage the equipment.



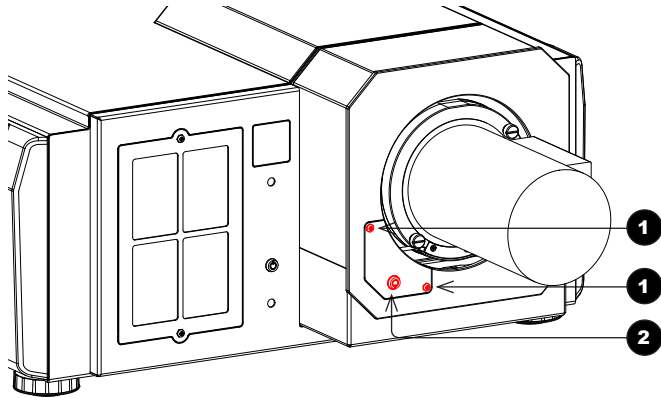
Take care to preserve the original lens packaging and protective caps for future use.



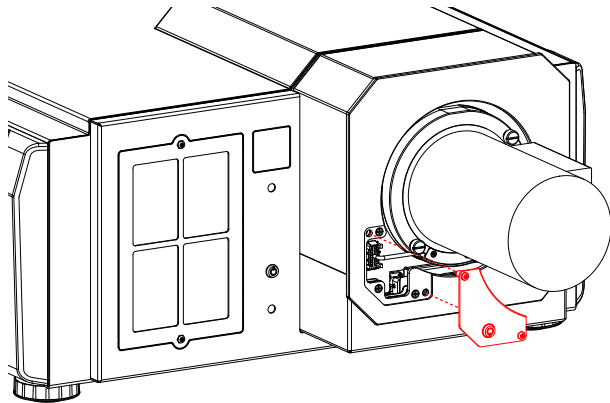
The projector will not power on without the lens fitted.

Removing the lens

1. Loosen **the two captive screws 1** on the lens remote lock cover, then release **the lock 2** using the provided key.



2. Remove the cover.



Notes



Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the lens, avoid using excessive force as this may damage the equipment.

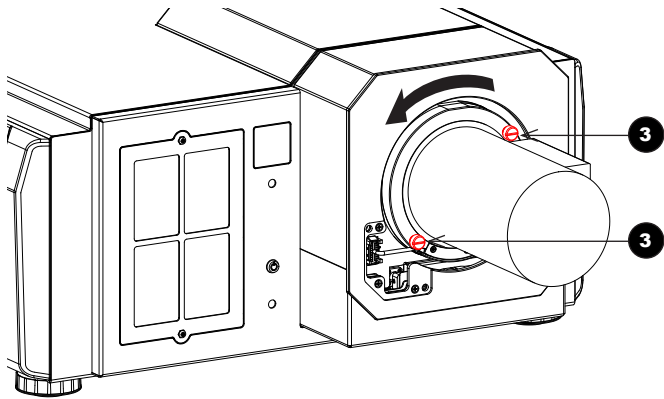


Take care to preserve the original lens packaging and protective caps for future use.

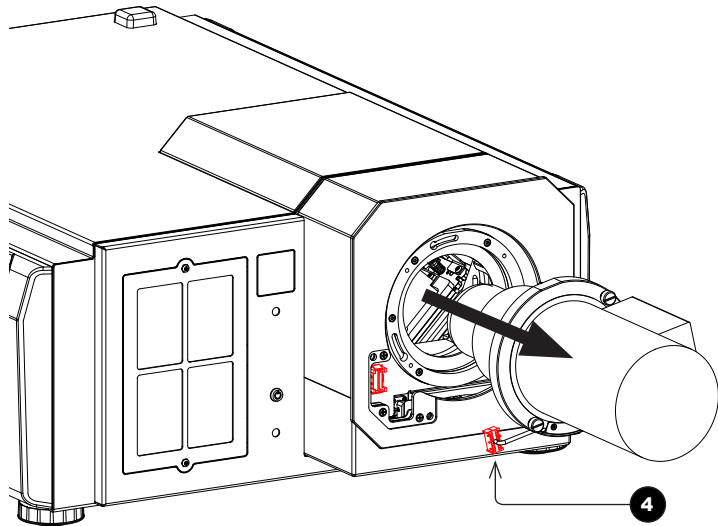


The projector will not power on without the lens fitted.

3. Loosen **the two captive screws 3** on the lens and rotate the lens counterclockwise until it stops.



4. Unplug **the remote lock connector 4** and pull the lens out of its socket.



Notes



Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the lens, avoid using excessive force as this may damage the equipment.



Take care to preserve the original lens packaging and protective caps for future use.



The projector will not power on without the lens fitted.

Lens part numbers

Throw ratios	Lens extension	Part number
1.13 - 1.31 : 1 zoom lens	253 mm	116-340
1.13 - 1.66 : 1 zoom lens	270 mm	116-044
1.30 - 1.85 : 1 zoom lens	225 mm	116-045
1.45 - 2.17 : 1 zoom lens	222 mm	116-046
1.63 - 2.71 : 1 zoom lens	134 mm	116-047
1.95 - 3.26 : 1 zoom lens	137 mm	116-048
2.71 - 3.89 : 1 zoom lens	190 mm	116-049

Notes



Before changing the lens, always make sure the projector is switched off and fully disconnected from its power supply.



When changing the lens, avoid using excessive force as this may damage the equipment.



Take care to preserve the original lens packaging and protective caps for future use.



The projector will not power on without the lens fitted.

Technical Specifications

Digital Projection reserves the right to change product specifications without prior notice.

Models

The specifications on these pages refer to the following projector:

Series name
INSIGHT 4K Laser

Color system: 3-chip DLP®

Display type: 3 x 1.38" DarkChip™ DMD™

DMD™ specification (native): 4096 x 2160 pixels, +/- 12° tilt angle

Fast transit pixels for smooth grayscale and improved contrast.

Notes

Inputs and outputs

Type	Connector	Qty
Video & Computer		
DisplayPort 1.2	DisplayPort	2
HDMI 1.4	HDMI	1
Option Board		
3G-SDI	BNC	4
DVI-D	DVI-D	2

Bandwidth

N/A

Remote control and keypad

- Wired remote control
- On-board keypad with LCD screen

Automation control


- RS232
- LAN


Color temperature

- User selectable via TCGD

Type	Connector	Qty
Communication & Control		
3D Sync Out	BNC	1
3D Sync In	BNC	1
LAN	RJ45	1
RS232	9-pin D-Sub	1
Wired Remote In	3.5 mm Stereo Jack	1
Service Port	USB Type A	1

Notes

 The default hardware configuration does not include an option board, which can be ordered separately.

 3G-SDI signals are very high speed digital signals which require better quality coaxial cable than conventional analogue video. The data rate is 3 Gigabits per second.

In choosing cable length and connectors for any installation the frequency response loss in decibels should be proportional to \sqrt{f} , from 1 MHz, to 3 GHz.

Lenses

Detailed information about available lenses can be found in **Appendix A: Lens Part Numbers**.

Further information about lens offsets can be found in **Positioning The Image > Maximum offset range**.

Lens mount

- Motorised shift, zoom and focus. Intelligent Lens Memory with user-definable preset positions.

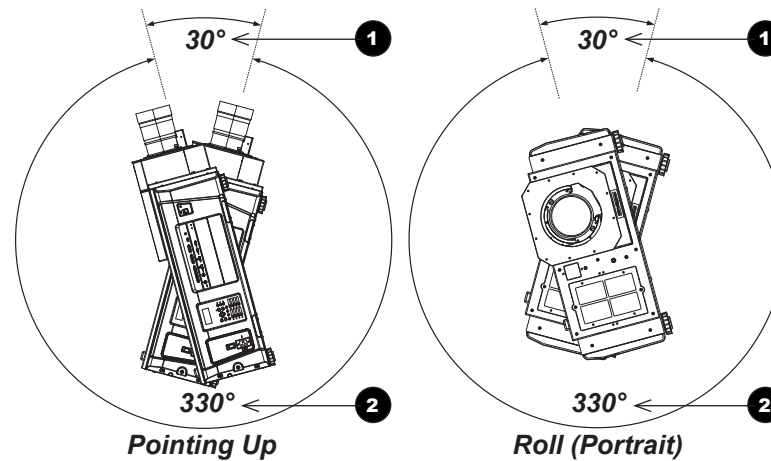
Mechanical mounting

- Front/Rear Table
- Front/Rear Ceiling
- Adjustable Front/Rear Feet

Orientation

- **Table Top or Inverted:** Yes
- **Pointing Up:** Yes, within the workable angle
- **Pointing Down:** Yes
- **Roll (Portrait):** Yes, within the workable angle

- 1 Non-workable angle
- 2 Workable angle



Notes

Information on lenses in this guide:

- [Appendix A: Lens Part Numbers](#) - detailed descriptions of available lenses.
- [Maximum offset range](#) - lens offsets.

See also the lens calculator on the Digital Projection website.

Electrical and physical specifications

- **Power requirements** 200-240 VAC, 50-60 Hz (single phase)
- **Power Consumption** 1600 W
- **Thermal Dissipation** 5027 BTU/hr
- **Fan Noise** 48 dBA
- **Operating Temperature** 0°C to 35°C (32 to 104F)
- **Storage Temperature** -10°C to 50°C (14 to 122F)
- **Operating Humidity** 20% to 80% non-condensing
- **Weight** 67 kg (148 lb)
- **Dimensions** H: 32.5 cm W: 70 cm L: 93.5 cm
H: 12.8 in W: 27.56 in L: 36.8 in

Safety & EMC regulations

- CE, FCC Class A, UL, CCC

Notes



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