Mercury Quad 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.

🔗 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

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Risk Group 3 Information

Light hazard warning

Failure to comply with the following may result in serious injury:

- No direct exposure to the beam is permitted, RG3 IEC 62471-5:2015.
- Operators control access to the beam within the hazard distance or install the projector at sufficient height to prevent exposures of spectators’ eyes within the hazard distance.

The hazard distance (Fig. 1) is the distance measured from the projection lens at which the intensity or energy per unit of surface is lower than the applicable exposure limit on the cornea or skin. If the person is within the hazard distance, the beam is considered unsafe for exposure.

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<th>Part Number</th>
<th>Hazard Distance</th>
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<td>0.67 : 1 fixed</td>
<td>105-607</td>
<td>0.47 m</td>
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<tr>
<td>1.12 : 1 fixed</td>
<td>105-608</td>
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<td>105-611</td>
<td>1.46 m</td>
</tr>
<tr>
<td>2.56 - 4.16 : 1 zoom</td>
<td>105-612</td>
<td>2.83 m</td>
</tr>
<tr>
<td>4.16 - 6.96 : 1 zoom</td>
<td>105-613</td>
<td>7.02 m</td>
</tr>
<tr>
<td>6.92 - 10.36 : 1 zoom</td>
<td>109-235</td>
<td>12.7 m</td>
</tr>
</tbody>
</table>

Notes

Fig. 1: hazard distance
Light hazard labels on the body of the projector
Light hazard labelling is part of the product label.

1. Product label
2. Risk Group 3 label
3. Hazard Warning symbol
4. Not For Home Use logo

Warning! Do not look into the beam. No direct eye exposure to the beam is permitted.
RG3
Hazard Distance: 0-300cm

Avertissement! Ne Pas Regarder Directement Dans Le Faisceau.
L'exposition Directe Des Yeux Au Faisceau Est Interdite.
RG3
Distance À Risque: 0-300cm
Introduction

Congratulations on your purchase of this Digital Projection product.

Advanced compact High Brightness projector for large venue applications. Includes:

- High frame rate capability up to 120Hz.
- Sequential, Dual Pipe and Domestic mandatory formats for 3D.
- HDBaseT® for transmission of uncompressed High Definition Video up to 100 m from the source.
- 3G-SDI with loop-through.
- Edge Blend including black level compensation.
- Geometry correction - Keystone, Cornerstone, Electronic Rotation, Pin/Barrel correction.
- Full non-linear warping via PC application.
- Blanking control for custom input window sizing.
- Control via LAN and RS232.
- Motorised lens mount for focus, zoom and H/V shift.

A serial number is located on the side of the projector. Record it here:
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High Brightness Digital Video Projector

INSTALLATION AND QUICK-START GUIDE
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**What's In The Box?**

- **Remote control** (117-780)
- **2x AAA batteries**
- **1x lens support bracket**
- **1x M4 screw**
- **Projector**
- **User Manual on disc** (118-698)
- **Important Information** (117-786)
- **remote control cable**
- **HDMI cable**
- **Power cable, United Kingdom** (112-000)
- **Power cable, Europe** (118-728)
- **Power cable 125V, North America** (118-726)
- **Power cable 250V, North America** (118-727)
- **Power cable, China** (118-729)

**Notes**

- Make sure your box contains everything listed. If any pieces are missing, contact your dealer.
- Only one remote will be supplied with the projector. For more information, see **Remote Control** further in this guide.
- You should save the original box and packing materials, in case you ever need to ship your projector.
- The projector is shipped without a lens.
- Only one power cable - dependent on the destination territory - will be supplied with the projector.
- The **lens support bracket** needs to be attached to the lens as shown below:
  - If you need to install and use the lens support bracket, remove the gearbox outer cover (red arrow) in advance.
Connecting The Power Supply

Lift the cable lock up, push the mains connector in firmly and push the lock down to secure the cable.

1. AC mains inlet with cable lock and power switch

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. Front infrared window
2. Power switch and power connection
3. Connection panel
4. Lens mount
5. Air inlet with replaceable filter
6. Adjustable foot
7. Detachable handle
8. Air outlet
9. Adjustable foot
10. Control panel
11. Lamp bay
12. Rear infrared window
13. Air inlet with replaceable filter
14. Detachable handle
15. Adjustable feet

Notes
**Control Panel**

**Buttons**

1. **POWER button**
   Switch the projector on and off (in STANDBY mode)

2. **MENU button**
   Access the projector OSD (on-screen display).

3. **Navigation (arrow buttons and ENTER)**
   Navigate the OSD and edit settings with the arrows, confirm choice with ENTER.

4. **INPUT button**
   Select input source.

5. **Focus IN / OUT**
   Adjust focus.

6. **Zoom IN / OUT**
   Adjust zoom.

7. **Shutter CLOSE / OPEN**
   Open and close the shutter.

8. **EXIT button**
   Close the OSD.

9. **SHIFT button**
   Press and hold this button, then press the arrow buttons to move the lens.
## Indicators

### Lamp 1-4 indicators

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<tr>
<td>On (green)</td>
<td>The lamp is switched on (100%).</td>
</tr>
<tr>
<td>On (amber)</td>
<td>The lamp is running on less than full capacity (77-99%).</td>
</tr>
<tr>
<td>Flashing (green)</td>
<td>The lamp is warming up.</td>
</tr>
<tr>
<td>Flashing (amber)</td>
<td>The lamp is cooling down.</td>
</tr>
<tr>
<td>On (red)</td>
<td>Ballast Comms Error (call service)</td>
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<tr>
<td>Flashing (red)</td>
<td>Lamp / Interlock Error</td>
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### ERROR indicator (red)

<table>
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<td>Flash once, then pause</td>
<td>Lamp failure.</td>
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<tr>
<td>Flash twice, then pause</td>
<td>Lamp door open.</td>
</tr>
<tr>
<td>Flash three times, then pause</td>
<td>Fan failure.</td>
</tr>
<tr>
<td>Flash four times, then pause</td>
<td>Over temperature.</td>
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<tr>
<td>On</td>
<td>System error.</td>
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### STANDBY indicator (green)

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<td>On</td>
<td>The projector is in STANDBY mode.</td>
</tr>
<tr>
<td>Flashing</td>
<td>The projector is in STANDBY mode.</td>
</tr>
<tr>
<td></td>
<td>It can be switched on with a network command.</td>
</tr>
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### ON indicator (blue)

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<td>Off</td>
<td>The projector is switched off.</td>
</tr>
<tr>
<td>On</td>
<td>The projector is switched ON.</td>
</tr>
<tr>
<td>Flashing</td>
<td>The projector is warming up or cooling down.</td>
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### Notes

- [1] 2 3 4
- 1. ERROR STANDBY
- 2. INPUT
- 3. CLOSE
- 4. OUTPUT
Remote Control

1. **Power ON / OFF**
   Turns power on and off.

2. **Pic Mute OPEN / CLOSE**
   Opens and closes the shutter.

3. **OSD ON / OFF**
   Enable and disable screen timeout messages and control whether to show the OSD during projection.

4. **MENU**
   Press to access the OSD. Press again to hide the OSD.

5. **Navigation (arrows and OK)**
   Navigate through the menus with the arrows, confirm your choice with **OK**. In lens adjustment modes, the arrows are used to move, zoom or focus the lens. See 11 below. In lens adjustment modes, or when the OSD is not showing, the **OK** button switches between modes: *Shift Adjustment* and *Zoom / Focus Adjustment*.

6. **EXIT**
   Go up one level in the OSD. When the top level is reached, press to close the OSD.

7. **FREEZE**
   Freeze the current frame.

8. **DEFAULT**
   When editing a parameter, press this button to restore the default value.

9. **INFO**
   Access information about the projector.

10. **RE-SYNC**
    Re-synchronise with the current input signal.

*continues on next page...*
**REMOTE CONTROL**

11 **LENS adjustment**
* FOCUS IN / OUT: adjust focus.
* SHIFT: press and hold this button, then use the Navigation arrow buttons to move the lens.
* ZOOM IN / OUT: adjust zoom.

12 **USER PRESET A, B, C, D**
Load user presets.

13 **ALT**
Press and hold this button to access alternative functions for all buttons with a green label.

14 **DVI / GAMMA / numeric input 3**
Select the DVI input.
Use with **ALT** to switch to the next gamma value:
...1.0, 1.8, 2.0, 2.2, 2.35, 2.5...

15 **HDMI 2 / CON / numeric input 2**
Select the HDMI 2 input.
Use with **ALT** to bring up the Contrast control, then adjust the value with the **LEFT** and **RIGHT** arrow buttons.

16 **HDMI 1 / BRI / numeric input 1**
Select the HDMI 1 input.
Use with **ALT** to bring up the Brightness control, then adjust the value with the **LEFT** and **RIGHT** arrow buttons.

17 **TEST / SWAP / numeric input 0**
Show a test pattern. Press again to show the next test pattern:
...Off, White, Black, Red, Green, Blue, CheckerBoard, CrossHatch, V Burst, H Burst, ColorBar...
When **PIP** mode is on, use this button with **ALT** to swap the main and sub images.

continues on next page...

**Notes**

For further information about user presets, see **Memory** in the **Operating Guide**.
17. DISPLAYPORT / R / numeric input 4
   Select DisplayPort input.

18. HD-T / G / numeric input 5
   Select the HDBaseT input.

19. 3GSDI / B / numeric input 6
   Select the 3G-SDI input.

20. VGA / 3D / numeric input 7
   Select the VGA input.
   Use with ALT to toggle the 3D Format setting between Off and Auto.

21. COMP1 / EYE / numeric input 8
   Select the Component 1 input.
   Use with ALT to switch between left and right eye 3D dominance.

22. COMP2 / PIP / numeric input 9
   Select the Component 2 input.
   Use with ALT to switch on Picture In Picture (PIP) mode.

23. ADDR / ALL (with red indicator at the top)
   Assign and unassign an IR remote address.
   **To assign an address:**
   1. Press and hold this button until the indicator starts flashing.
   2. Release this button and while the indicator is still flashing, enter a two-digit address using the numeric input buttons. The indicator will flash three times quickly to confirm the change.

   **To unassign an address and return to the default address 00,**
   • Press and hold ALT and this button simultaneously until the indicator flashes to confirm the change.
**Infrared reception**

The projector has infrared sensors at the front and back.

The angle of acceptance is 40°. Make sure that the remote control is within the angle of acceptance when trying to control the projector.
**Positioning The Screen And Projector**

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 positions of the feet for table mounting, and the fixing holes for ceiling mounting.

1. **Four adjustable feet**
2. **Six M6 holes for ceiling mount**
   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 50 cm (20 in) of space between the ventilation outlets and any wall, and 30 cm (12 in) on all other sides.
- Do not stack more than 3 projectors.
Removing the detachable handles

The projector is fitted with detachable handles for easier lifting and carrying.
You may need to remove the handles as they are likely to get in the way of rigging frames and other installation equipment.
1. Position the projector upside down on a flat surface.
2. Remove the screws to free the handles as shown in the illustration.
The handles can be detached and reattached multiple times.

Notes

⚠️ The handles are not suitable for supporting the weight of the projector in permanent installations. DO NOT attach clamps and truss mounts to the handles. DO NOT use the handles in ceiling suspension scenarios.

⚠️ Disconnect the projector from the mains before attempting to remove the handles.

⚠️ Always allow the projector to cool for 5 minutes before disconnecting the power or moving the projector.

Preserve the removed handles together with the full set of screws to ensure that they can be reattached if needed.
**Roll and pitch**

Do not tilt the projector more than ±10° from side to side (roll) when in use, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.

The projector may be tilted forwards and backwards (pitch) as necessary.
Changing The Lens

Inserting a new lens

1. Turn the lens release lever clockwise so that it is pointing upwards, to open the lock fully.

2. Remove the rear lens cap from the lens.

3. Insert the lens into the lens aperture, making sure that the plug on the zoom drive mechanism lines up with the socket on the front of the projector, then push the lens in firmly as far as it will go.

4. Turn the lens release lever anti-clockwise to the mid-position.

5. The lens can now be pushed in further. Push the lens in firmly as far as it will go.

6. Turn the lens release lever fully anti-clockwise so that it is pointing downwards, to close the lock fully.

Removing the lens

To remove the lens, reverse the procedure described in Inserting a new lens above:

1. Turn the release lever up to the mid-position, then pull the lens out as far as it will go.

2. Turn the release lever clockwise so it is pointing upwards, then pull the lens out completely.

Notes

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

- Always allow the projector to cool for five minutes before disconnecting the power or moving the projector.

- The lens release lever should always be set to the locked position to prevent the lens from falling out.

- Do not place the projector with its front panel down on a surface, as this may damage the lens or the lens release lever.

- Avoid touching the surface of the lens as this may result in image impairment.

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

1. Loosen the four captive screws on the back of the projector shown in Fig. 1.

2. Pull out the cover (Fig. 2) to reveal the lamp bay (Fig. 3).

3. Each individual lamp module is held into position by three captive screws (Fig. 4). Loosen the screws and pull out the lamp module (Fig. 5).

4. Slide the new lamp module in the empty slot and fasten the screws to lock it into position.

5. Return the cover to its place and tighten the four captive screws.

Notes

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

- Always allow the projector to cool for five minutes before disconnecting the power or moving the projector.

- When changing a lamp, avoid using excessive force as this may damage the equipment.

- Running on full power each lamp has a typical life of 2500 hours.
Changing The Filters

Front filter
1. Pull out the filter compartment cover.
2. Replace the filter: slide the old filter out of the compartment, then push the new filter in its place.
3. Replace 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.

🚀 In a normal environment the filters should be changed every 2500 hours.
Rear filter

1. Loosen the captive screws 1 and 2.
2. Remove the filter compartment cover.
3. Change the filter: slide the old filter out as shown in the illustration, then push the new filter in.
4. Return the cover back in its place and fasten the screws to lock it into position.

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.
- In a normal environment the filters should be changed every 2500 hours.
Operating The Projector

Switching the projector on
1. Ensure a lens is fitted. Connect the power cable between the mains supply and the projector. (See Connecting the power supply above.) Switch on at the switch next to the power connector.
2. The **POWER** indicator lights red to signal that the projector is in STANDBY mode. Press one of the following buttons:
   - On the remote control, the **ON** button
   - On the projector control panel, the **POWER** button.

   The fans begin working, then the **POWER** indicator begins flashing green. When the flashing stops, the **POWER** and **LIGHT** indicators both light steady green. The projector is switched on.

Switching the projector off
1. Press **OFF** on the remote control or **POWER** on the control panel, then press again to confirm your choice.

   The **POWER** indicator on the control panel will start flashing amber, the system will go out and the cooling fans will run for a short time until the **POWER** indicator goes steady red to indicate that the projector has entered STANDBY mode.
2. If you need to switch the projector off completely, switch off at the mains power switch next to the power connector and then disconnect the power cable from the projector.

Notes

- See also Connecting The Power Supply earlier in this guide.
- 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 an input signal
1. Connect one or more image sources to the projector.
2. Select the input you want to display:
   • Press one of the input buttons on the remote control.
   • Alternatively, open the On-screen display (OSD) by pressing MENU. Highlight Input from the main menu, press ENTER/OK and then select an input signal using the UP ▲ and DOWN ▼ arrow buttons. Press ENTER/OK to confirm your choice.

Selecting a test pattern
To display a test pattern:
• Press TEST on the remote control.
  Change the test pattern using the LEFT ◀ and RIGHT ► arrow buttons. Test patterns are displayed in the following order:
  White, Black, Red, Green, Blue, CheckerBoard, CrossHatch, V Burst, H Burst, ColorBar, Plunge, Off
• Alternatively, open the OSD by pressing MENU. Highlight Test Patterns from the main menu, then select a test pattern using the LEFT and RIGHT arrow buttons.

After the final test pattern, the projector exits test pattern mode and returns to the main image. To view test patterns again, you need to press TEST again. If you wish to exit the test patterns before you reach the final one,
• press TEST or EXIT at any time.
Adjusting the lens
The lens can be adjusted using the Lens menu, or using the lens buttons on the remote control.

Lens menu
The Lens menu provides access to the Lens Control setting and the Lens Center command.

Lens Control allows Zoom, Focus and Shift adjustment using the arrow buttons. The setting operates in Zoom/Focus Adjustment and Shift Adjustment mode.

Press ENTER/SELECT to switch between the two modes.

Remote control
Use the remote control to adjust zoom, focus and shift directly, without opening a menu:
- OK enters lens control, then switches between Zoom/Focus Adjustment and Shift Adjustment.
- EXIT exits lens control and opens the Lens menu.
- MENU exits lens control and returns to the main image.
- The arrow buttons adjust zoom, focus and shift as indicated on the screen.

Adjusting the image

Orientation
This can be set from the Setup menu.
- Highlight Orientation and choose from Front Tabletop, Front Ceiling, Rear Tabletop and Rear Ceiling.

Keystone
This can be set from the Geometry menu.

Picture
- The aspect ratio of the screen can be set from Screen Setting in the Setup menu.
- Settings such as Gamma, Brightness, Contrast, Saturation, Hue and Sharpness can be set from the Image menu.
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Mercury Quad Series
High Brightness Digital Video Projector

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**Signal Inputs**

1. **HDBaseT**
   Receives digital signal from HDBaseT-compliant devices.

2. **HDMI I**
   HDMI 1.4a input. Connect an HDMI cable to the connector.

3. **HDMI II**
   HDMI 1.4a input. Connect an HDMI cable to the connector.

4. **DisplayPort**
   DisplayPort 1.1a input. Connect a DisplayPort cable to the connector.
   Supports sources up to 1920x1200 resolution, 24-120 Hz. Supports HDCP.

5. **3G-SDI in / out**
   Connect the IN socket to a 3G-SDI source.
   Connect the OUT to distribute the 3G-SDI signal to another projector.

---

**Notes**

- For simultaneous HDBaseT and LAN connectivity, a third-party distribution product can be utilised to combine HDBaseT video stream with LAN connection for delivery to the projector.

- The projector can receive 100/120Hz and display 3D at 100/120Hz.

- For a complete listing of all supported signal input modes, see Appendix B: Supported Signal Input Modes in the Reference Guide.

- For a complete listing of pin configurations for all signal and control connectors, see Appendix C: Wiring Details in the Reference Guide.
**EDID on the HDMI and DisplayPort inputs**

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

Otherwise 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/DisplayPort switchers with the projector**

When using an HDMI/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.

---

**Notes**

The EDIDs in the switcher should be the same as the one in the projector.
### 3D connections

**3D sources up to 60Hz requiring frame doubling and left/right interleaving**

1. Connect to either of the following inputs on the connection panel:
   - HDMI 1
   - HDMI 2
   - HDBaseT

2. Set **3D Format** in the **3D** menu to match the format of the incoming signal. Choose from *Auto, Side by Side (Half)* and *Top and Bottom*.
   
   The **Frame Packing** format is automatically detected by the projector.

**Frame sequential 3D sources up to 120Hz**

- Connect to the DisplayPort input.

  The **Frame Sequential** format is automatically detected by the projector and is supported on the DisplayPort input only.

**Dual Pipe 3D**

1. Connect the left eye output to the **HDMI 1** socket and the right eye output to the **HDMI 2** socket.

2. Set **3D Format** in the **3D** menu to **Dual-Pipe**.

---

### Notes

- For a complete listing of all supported signal input modes, see **Appendix B: Supported Signal Input Modes** in the **Reference Guide**.

- For a complete listing of pin configurations for all signal and control connectors, see **Appendix C: Wiring Details** in the **Reference Guide**.
**3D Sync**

**3D Sync in**
Sync input signal – normally only required for Sequential 3D sources.
- Connect the 3D sync from your graphics card or server.

**3D Sync out**
Sync output signal. This may be affected by the Sync Offset setting in the 3D Control menu.
Connect this to your IR emitter or ZScreen.

---

**Notes**

- For a complete listing of pin configurations for all signal and control connectors, see Appendix C: Wiring Details in the Reference Guide.
- The projector can be used with active 3D glasses. Passive 3D glasses such as polarized and split wavelength glasses cannot be used with this projector.
Control Connections

1. LAN
   - All of the projector’s features can be controlled via a LAN connection, using commands described in the Protocol Guide.
   - Use a crossed LAN cable to connect directly to a computer, or an uncrossed cable to connect to a network hub.
   This connection is also used by the HDbaseT input.

2. Trigger 1 & Trigger 2
   The Trigger outputs are activated by one of the three following conditions, as set in the Setup menu:
   - Screen trigger: can be connected to an electrically operated screen, automatically deploying the screen when the projector starts up, and retracting the screen when the projector shuts down.
   - Aspect ratio trigger: can be used to control screen shuttering for different aspect ratios.
   - RS232 trigger: can be used to control the screen or screen shuttering on receipt of an RS232 command

3. RS232
   - All of the projector’s features can be controlled via a serial connection, using commands described in the Protocol Guide.
   - Use a straight-through cable to connect directly to a computer.

4. Wired Remote
   The remote control can be connected using a standard TRS cable.

Notes

- For simultaneous HDBaseT and LAN connectivity, a third-party distribution product can be utilised to combine HDBaseT video stream with LAN connection for delivery to the projector.
- For a list of all commands used to control the projector via LAN, see the Protocol Guide.
- For a complete listing of pin configurations for all signal and control connectors, see Appendix C: Wiring Details in the Reference Guide.
- Only one remote connection (RS232 or LAN) should be used at any one time.
**LAN connection examples**

The projector’s features can be controlled via a LAN connection, using Digital Projection’s *Projector Controller* application or a terminal-emulation program.

![LAN connection diagram]

**Notes**

*Projector Controller* is available for download, free of charge, from the Digital Projection website.
RS232 connection example

Connection Guide

Notes

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Using The Menus

Opening the OSD
Access the various menus using either the projector control panel or the remote control. On either device,

• press the MENU button.

The on-screen display (OSD) opens showing the list of available menus.

Opening a menu
Move up and down the list using the UP ▲ and DOWN ▼ arrow buttons.

To open a menu,

• press ENTER on the control panel or OK on the remote control.

This guide refers to the above two buttons as ENTER/OK.

Exiting menus and closing the OSD
To go back to the previous page,

• press EXIT.

When you reach the top level, pressing EXIT will close the OSD.

To close the OSD from any page,

• press MENU.

---

**Main Menu**

<table>
<thead>
<tr>
<th>Input</th>
<th>HDMI 1</th>
</tr>
</thead>
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<td>Test Pattern</td>
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<td>Color</td>
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<td>Geometry</td>
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<td>Edge Blend</td>
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<td>3D</td>
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<tr>
<td>Lamp Control</td>
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<tr>
<td>Setup</td>
<td></td>
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<tr>
<td>Network</td>
<td></td>
</tr>
</tbody>
</table>

---

**On-screen display (OSD): top level menus**

---

**Notes**
Inside a menu
When you open a menu, the page consists of the following elements:

• Title bar at the top
  Shows which menu you have accessed.
• Highlighted item
• Available and unavailable items
  Unavailable items appear a pale gray color. Whether an item is available may depend on other settings.
• The text or symbol to the right of an item shows whether the item:
  • has a value that can be changed (the current value is shown)
  • opens a sub-menu (an arrow button is displayed)
  • executes a command (the space to the right of the item is blank).

Accessing sub-menus
Use the UP ▲ and DOWN ▼ arrow buttons to highlight the sub-menu, then press ENTER/OK.

Executing commands
If the item contains a command, highlighting it reveals an OK button.
Press ENTER/OK to execute the highlighted command.

You may be asked for confirmation. Use the ENTER/OK to confirm, or EXIT to cancel.
Editing projector settings
If the highlighted menu item contains a list of values to choose from, you can change the value by doing the following:
1. Highlight the menu item and press ENTER/OK.
2. In the list of values that opens, use the UP ▲ and DOWN ▼ arrow buttons to highlight a value, then press ENTER/OK again to select the highlighted value.

Using a slider to set a value
Some parameters open a slider. To set such a parameter:
1. Press the LEFT ◀ or RIGHT ► arrow button, or ENTER/OK. The arrow buttons will open the slider and adjust the value at the same time. ENTER/OK will open the slider without altering the initial value.
2. Use the LEFT ◀ and RIGHT ► arrow buttons to move the slider.
3. When ready, press EXIT to exit the slider and return to the menu, or press MENU to exit the slider without showing the menu again.

Editing numeric values
Some parameters take numeric values without using sliders - for example, color matching values or IP addresses.
1. Use the UP ▲ and DOWN ▼ arrow buttons to highlight the row containing the numeric field you wish to edit.
2. Press ENTER/OK to enter edit mode. A numeric field in edit mode is white text on blue background.
3. In edit mode:
   • Use the UP ▲ arrow button to increase the numeric value.
   • Use the DOWN ▼ arrow button to decrease the numeric value.
4. Use the LEFT ◀ and RIGHT ► arrow buttons to edit the next or previous numeric fields within the same row.
5. Once ready, press ENTER/OK to exit edit mode.
Using The Projector

Main menu

- Input
  Press ENTER/OK to open the list of available inputs.
  Use the UP ▲ and DOWN ▼ arrow buttons to select an input from the list, then press ENTER/OK to confirm your choice.
  Press EXIT to return to the main menu.

- Test Pattern
  Choose from:
  ...Off, White, Black, Red, Green, Blue, CheckerBoard, CrossHatch, V Burst, H Burst, ColorBar, Plunge...
  Use the LEFT ◀ and RIGHT ► arrow buttons to switch between values.

- Lens, Image, Color, Geometry, Edge Blend, 3D, Laser, Setup and Network
  Press ENTER/OK to open these menus and access various settings.

Press the DOWN ▼ arrow at the bottom of the page to access additional menus:

- PIP and Information
  Press ENTER/OK to open these menus and access various settings.

Press the UP ▲ arrow to return to the previous page.

Notes

See Signal Inputs in the Connection Guide for further information about the available inputs and connections.

Selecting a test pattern hides the OSD. Press EXIT to hide the test pattern, and then press MENU to show the OSD.
Lens menu

- **Lens Lock**
  When this feature is **On**, all other **Lens** menu items are disabled.

- **Lens Control**
  Opens a sub-menu, see below.

- **Center Lens**
  Centers the lens.

- **Lens Memory**
  Opens a sub-menu, see next page.

---

### Lens Control

**Lens Control** settings operate in **Zoom/Focus Adjustment** and **Shift Adjustment** mode. Press **ENTER/OK** to switch between modes.

When in **Zoom/Focus Adjustment** mode:

- Use the **UP ▲** and **DOWN ▼** arrow buttons to adjust **Zoom**.
- Use the **LEFT ◄** and **RIGHT ►** arrow buttons to adjust **Focus**.

When in **Shift Adjustment** mode, use the arrow buttons to adjust **Shift**.

---

### Notes

When adjusting focus and zoom, you may find it useful to display the **CrossHatch** test pattern: press **TEST** on the remote control and navigate through the list of patterns using the **LEFT ◄** and **RIGHT ►** arrow buttons.
Lens menu continued from previous page

**Lens Memory**

This menu allows you to load, save and delete up to ten lens presets, containing position, zoom, focus and shift adjustment information.

For example, if using different screen sizes and aspect ratios, you can save zoom, focus and positioning for each screen size and aspect ratio in a dedicated preset.

Use Clear Memory to delete a memory preset if you need to save a new combination of lens settings in its place. Overwriting a saved memory preset is not possible.

### Lens Memory

<table>
<thead>
<tr>
<th>Lens Load Memory</th>
<th>Lens Save Memory</th>
<th>Lens Clear Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory 1 OK</td>
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<tr>
<td>Memory 10</td>
<td>Memory 10</td>
<td>Memory 10</td>
</tr>
</tbody>
</table>

#### Notes

The Lens Memory function is only available with memory enabled lenses.
**Image menu**

- **Gamma**
  
  Choose a de-gamma curve from **1.0, 1.8, 2.0, 2.2, 2.35 and 2.5**.
  
  Used correctly, the Gamma setting can improve contrast while maintaining good details for blacks and whites.
  
  If excess ambient light washes out the image and it is difficult to see details in dark areas, lower the Gamma setting to compensate. This improves contrast while maintaining good details for blacks. Conversely, if the image is washed out and unnatural, with excessive detail in black areas, increase the setting.

- **Brightness, Contrast, Saturation, Hue, Sharpness**
  
  Highlight the setting you wish to edit, and then press ENTER/OK, or the LEFT or RIGHT arrow button to open the slider.
  
  Use the LEFT and RIGHT arrow buttons to adjust the slider.
  
  Press EXIT to close the slider and return to the menu, or MENU to close the slider and return to the projected image.

- **Noise Reduction**
  
  This item opens a sub-menu, see next page.

- **Freeze**
  
  Freezes the current frame.
  
  Press again to un-freeze.

- **Resync**
  
  Press ENTER/OK to force the projector to resynchronise with the current input.
Image menu continued from previous page

Noise Reduction

• **Temporal**
  A time-based filter that removes the noise on the luminance component.

• **Block**
  This filter helps reduce block noise, which appears like small blocks in the image and is caused by MPEG compression.

• **Mosquito**
  This filter helps reduce mosquito noise, which appears around the edges of the image and is caused by the image compression algorithm.

• **Horizontal, Vertical**
  These filters soften the image.

• **Reset**

### Noise Reduction

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Temporal</td>
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<td>Block</td>
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<td>Mosquito</td>
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<tr>
<td>Horizontal</td>
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</tr>
<tr>
<td>Vertical</td>
<td>0</td>
</tr>
<tr>
<td>Reset</td>
<td>0</td>
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### Position and Phase

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</thead>
<tbody>
<tr>
<td>V Position</td>
<td>100</td>
</tr>
<tr>
<td>H Position</td>
<td>100</td>
</tr>
<tr>
<td>Phase</td>
<td>100</td>
</tr>
<tr>
<td>Tracking</td>
<td>100</td>
</tr>
<tr>
<td>Sync Level</td>
<td>100</td>
</tr>
</tbody>
</table>
**Color menu**

**Color Space**
In most cases, the Auto setting determines the correct colorspace to use. If it does not, you can choose a specific colorspace:

Choose from Auto, YPbPr, YCbCr, RGB PC and RGB Video.
Color menu continued from previous page

**Color Mode**
The projector can work in the following color modes: ColorMax, Manual Color Matching, Color Temperature and Gains and Lifts.

<table>
<thead>
<tr>
<th>Color</th>
<th>Color Space</th>
<th>Color Mode</th>
<th>Color Temperature</th>
<th>Manual Color Matching</th>
<th>Gains and Lifts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Auto</td>
<td>ColorMax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ColorMax**
1. Set Color Mode to ColorMax.
2. Navigate to the ColorMax setting. Choose from REC709, EBU, SMPTE, Native, User 1 and User 2.

User 1 and User 2 are user-defined color gamuts set via the Setup > ColorMax menu.

**Notes**
- Only one color mode can be selected at a time. Settings used by the other color modes are disabled.
- See Setup menu for further information about setting up the User 1 and User 2 color gamuts.
**Manual Color Matching**

1. Set **Color Mode** to **Manual Color Matching**.

2. Open the **Manual Color Matching** submenu.

   Here you can do the following:
   - Switch **Auto Test Pattern On** and **Off**.
   - Adjust **Hue**, **Saturation** and **Gain** settings for each individual color to improve the color balance of the projected image.
   - Adjust white balance RGB values.
   - Reset all values.

---

**Notes**

For more details about the **Hue**, **Saturation** and **Gain** settings, see **Color matching parameters explained** further in this guide.
**Color menu continued from previous page**

**Color matching parameters explained**
The levels of hue, saturation and gain in the Manual Color Matching menu change the color values in the following ways:

1. **Hue**
   Specifies the position of each color (red, yellow, green, cyan, blue and magenta) relative to its neighboring colors.

2. **Saturation**
   Specifies the level of white in each color (i.e. how "pale" each color is).

3. **Gain**
   Controls the amount of light that goes into each color, i.e. the lowest gain would produce black.
Color menu continued from previous page

**Color Temperature**

1. Set **Color Mode** to **Color Temperature**.
2. Navigate to the **Color Temperature** setting. Choose a value from **3200K** (warmer) to **9300K** (cooler) or **Native** (no correction).

<table>
<thead>
<tr>
<th>Color Space</th>
<th>Auto</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color Mode</strong></td>
<td>Color Temperature</td>
</tr>
<tr>
<td><strong>ColorMax</strong></td>
<td>3200K</td>
</tr>
<tr>
<td><strong>Manual Color Matching</strong></td>
<td>5400K</td>
</tr>
<tr>
<td><strong>Color Temperature</strong></td>
<td>6500K</td>
</tr>
<tr>
<td><strong>Gains and Lifts</strong></td>
<td>7500K</td>
</tr>
<tr>
<td></td>
<td>9300K</td>
</tr>
<tr>
<td></td>
<td>Native</td>
</tr>
</tbody>
</table>

**Notes**

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Color menu continued from previous page

Gains and Lifts
Lifts allow you to adjust black levels of individual colors, while gains adjust the bright part of the scale.

Set the sliders as required.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Red Lift</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Lift</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Lift</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Gain</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Gain</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Gain</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reset</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Geometry menu

This menu allows you to compensate for image distortions caused by an unusual projection angle or irregular screen surface.

Aspect Ratio
This feature defines the aspect ratio of the source.

Use the Screen Setting feature (Setup menu) to define the screen aspect ratio. It will enable the aspect ratio defined here best fit the actual screen.

If you choose a preset aspect ratio from here, it will give you the best fit for your selection.

Choose from:
- 5:4
- 4:3
- 16:10
- 16:9
- 1.88
- 2.35
- TheaterScope
- Source
- Unscaled

Notes

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.

Some combinations of aspect ratios (selected from Geometry > Aspect Ratio and from Setup > Screen Setting) may result in black bars all around the image: letterboxing and pillarboxing due to the disagreeing width and height of image and frame.

See next page for further information about the TheaterScope aspect ratio.
Theaterscope setting

The TheaterScope setting is used in combination with an anamorphic lens to restore 2.35:1 images packed into a 16:9 frame. Such images are projected with black lines at the top and bottom of the 16:9 screen to make up for the difference in aspect ratios.

Without an anamorphic lens and without the TheaterScope setting applied, a 16:9 source containing a 2.35:1 image looks like this:

If we change the setting to TheaterScope, the black lines will disappear but the image will stretch vertically to reach the top and bottom of the DMD™:

An anamorphic lens will stretch the image horizontally, restoring the original 2.35 ratio:

Notes

- TheaterScope is used with an anamorphic lens.
- If you use TheaterScope, set your screen aspect ratio to 16:9.
Digital Projection Mercury Quad Series

USING THE PROJECTOR

Geometry menu continued from previous page

Digital Zoom
Digital zooming enlarges a section of the image, while the area outside the enlarged section is cropped out to preserve the overall image size.

- **Digital Zoom** defines the level of zoom that needs to be applied. If **Digital Zoom** is set to 0, then the other settings in the menu will be disabled.
- **Digital Pan** and **Digital Scan** specify the area that is being enlarged:
  - **Digital Pan** adjusts the horizontal coordinates.
  - **Digital Scan** adjusts the vertical coordinates.

<table>
<thead>
<tr>
<th>Digital Zoom</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Pan</td>
<td>0</td>
</tr>
<tr>
<td>Digital Scan</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes
Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Geometry menu continued from previous page

Overscan
Use this setting to compensate for noisy or badly defined image edges.

Crop removes unwanted artifacts from the edges of your image by cropping the edges.
Zoom increases the size of the image to force the edges off-screen.

---

Notes
Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.

---

Image with noisy edges

Overscanned image
Geometry menu continued from previous page

Blanking
Use this feature to:

• fit an odd-sized screen;
• cut off timecode dots in the top line of a picture;
• cut off subtitles, etc.

Select the edge you wish to blank and use the **LEFT** and **RIGHT** arrow buttons to determine the amount of correction.

Use the **Reset** command to restore blanked edges.

<table>
<thead>
<tr>
<th>Blanking</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0</td>
</tr>
<tr>
<td>Bottom</td>
<td>0</td>
</tr>
<tr>
<td>Left</td>
<td>0</td>
</tr>
<tr>
<td>Right</td>
<td>0</td>
</tr>
<tr>
<td>Reset</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes
Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Geometry menu continued from previous page

Keystone

Use this setting to compensate for any distortion caused by the projector being in a different horizontal or vertical plane to the screen.

Keystone example

1. The projector is positioned at an angle
2. The resulting image is distorted
3. The image is corrected when Keystone is applied

Notes

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Geometry menu continued from previous page

Keystone settings

1. Projector to the left
   The projector is positioned to the left of the screen.
   To correct, apply a positive Horizontal Keystone value using the RIGHT arrow button.

2. Projector to the right
   The projector is positioned to the right of the screen.
   To correct, apply a negative Horizontal Keystone value using the LEFT arrow button.

3. Projector high
   The projector is positioned above the screen at a downward angle.
   To correct, apply a negative Vertical Keystone value using the DOWN arrow button.

4. Projector low
   The projector is positioned below the screen at an upward angle.
   To correct, apply a positive Vertical Keystone value using the UP arrow button.

5. Projector straight
   The projector is directly opposite the screen at a right angle both horizontally and vertically.
   No correction is needed.

Notes

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Geometry menu continued from previous page

4 Corners
For each corner, apply horizontal and / or vertical correction as necessary to restore the rectangular shape of the image.

Top Right Corner example
In this illustration, the top right corner requires both horizontal and vertical correction.

Notes
- Corner corrections provide a simple setup for awkward installations and irregular shaped screens that may distort the image. To apply a similar (but less flexible) correction, while preserving the original aspect ratio of the image, use the Keystone menu.

- Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Geometry menu continued from previous page

Rotation
Use this feature for example to correct a mounting error causing the image not to be level with the screen.

Rotation example

1. DMD™ area
   The DMD™ is not rotated. It still covers the area that would be occupied by the image without correction.

2. Rotated image
   The image is smaller than the surrounding DMD™ area. It is scaled in order to remain within the DMD™ area.

3. Angle of rotation
   The angle equals a quarter of the Rotation setting. In this example the angle is 5°, therefore Rotation = 20.

Notes
Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Geometry menu continued from previous page

Pincushion / Barrel

Pincushion or barrel distortions are the result of poor or incorrect tensioning of the screen or using a surface that is not flat.

Use the **Pincushion / Barrel** control to compensate electronically for such distortions.

You can also use this menu to make simple panoramic screen corrections without using external processors.

Pincushion / Barrel example

The illustration shows pincushion and barrel correction applied both horizontally and vertically, in equal measures.

![Pincushion example](image)

![Barrel example](image)

Notes

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Geometry menu continued from previous page

**Arc**

This is a geometric correction similar to pincussion and barrel but applied one side at a time, asymmetrically. For example, you can apply the correction to the top while the bottom remains unchanged.

<table>
<thead>
<tr>
<th>Arc</th>
<th>Top</th>
<th>Bottom</th>
<th>Left</th>
<th>Right</th>
<th>Reset</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Notes**

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
**Geometry menu continued from previous page**

**Custom Warp**

Set to **Off**, **User 1** or **User 2** as required.

<table>
<thead>
<tr>
<th>Geometry</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect Ratio</td>
<td></td>
</tr>
<tr>
<td>Digital Zoom</td>
<td></td>
</tr>
<tr>
<td>Overscan</td>
<td>Off</td>
</tr>
<tr>
<td>Blanking</td>
<td></td>
</tr>
<tr>
<td>Keystone</td>
<td></td>
</tr>
<tr>
<td>4 Corners</td>
<td></td>
</tr>
<tr>
<td>Rotation</td>
<td></td>
</tr>
<tr>
<td>Pincushion / Barrel</td>
<td></td>
</tr>
<tr>
<td>Arc</td>
<td></td>
</tr>
<tr>
<td>Custom Warp</td>
<td>Off</td>
</tr>
</tbody>
</table>

**Notes**

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
**Edge Blend menu**

Use this menu to blend together images from an array of two or more projectors.

The feature feathers the light output of the projector within the edges that overlap with other projectors in the array: as a result, the overlapping edges are evenly lit and easily blend in with the rest of the image.

- **Edge Blend**
  Enable and disable Edge Blend

- **Align Pattern**
  Add markers to the image showing the edges of the blend area and making the overlaps more visible to help adjust the physical position of the projectors in the array.

- **Blend Width**
  Determine the width of the blended regions.

- **Black Level Uplift**
  Adjust black levels to compensate if the blended regions appear brighter than the rest of the image.

- **Reset**
  Reset all Edge Blend settings to their factory default values.

### Edge Blend Menu

<table>
<thead>
<tr>
<th>Edge Blend</th>
<th>On</th>
</tr>
</thead>
<tbody>
<tr>
<td>Align Pattern</td>
<td>Off</td>
</tr>
<tr>
<td>Blend Width</td>
<td></td>
</tr>
<tr>
<td>Black Level Uplift</td>
<td></td>
</tr>
<tr>
<td>Reset</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

- **When Edge Blend is set to Off,** all other edge blend settings are disabled.

- **The picture in the blend region needs to be delivered to all overlapping projectors, which may require a special setup of the source.**

- **Some settings may be unavailable depending on other settings.** For more information, see Possible Combinations Of Settings further in this guide.
**Edge Blend menu continued from previous page**

**Blend Width**

Use the LEFT ← and RIGHT → arrow buttons to set the width of the blended regions:

1. Top
2. Bottom
3. Left
4. Right

### Blend Width

<table>
<thead>
<tr>
<th></th>
<th>Top</th>
<th>Bottom</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Notes**

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Black Level Uplift

Black in the blended regions appears less dark than in the rest of the image. To compensate for this, use this menu to raise the black levels of the rest of the image:

- Set **All** to the required amount of black level correction. This will apply equal correction to the black levels of all colors.
- If necessary, use the individual color sliders (**Red**, **Green** and **Blue**) for fine adjustment.

You may experience artifacts at the edges where the blended region of one projector overlaps the pond of mirrors of its neighbor. In the example below, the blended image comes from two projectors, 1 and 2. Both images have black level uplift applied; as a result, artifacts 3 and 4 have emerged at the edges where the black level uplift region of one projector overlaps the pond of mirrors of the other.

To remove the artifacts, you need to slightly reduce the size of the black level uplift region of each projector so it does not overlap the pond of mirrors of the other projector.

- Depending on your array, use **Top**, **Bottom**, **Left** and/or **Right** to reduce the black level uplift size. In the example below, use the **Right** slider of the projector on the left 1 to remove the artifact on the right 4, and the **Left** slider of the projector on the right 2 to remove the artifact on the left 3.

### Notes

- Enable **Align Pattern** from the **Edge Blend** menu to see the black level uplift area.
- Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
3D menu
Use this menu to enable, disable and set up 3D input, as follows:

- **3D Format** — Off, Auto, Side by Side (Half), Top and Bottom, Dual Pipe and Frame Sequential.
- **Eye Swap** — Normal and Reverse (set to Reverse if the left- and right-eye images are displayed in the wrong order)
- **Dark Time** — 0.65 ms, 1.3 ms and 1.95 ms. Set to reduce the effect of images overlapping while the glasses are switching.
- **Sync Offset** — use the LEFT ◀ and RIGHT ▶ arrow buttons to compensate for signal processing delays in the projector.
- **Sync Reference** — External, Internal and Auto.

### 3D menu settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D Format</td>
<td>Auto, Off, Auto, Side by Side (Half), Top and Bottom, Dual Pipe and Frame Sequential.</td>
</tr>
<tr>
<td>Eye Swap</td>
<td>Normal, Reverse (set to Reverse if the left- and right-eye images are displayed in the wrong order)</td>
</tr>
<tr>
<td>Dark Time</td>
<td>0.65 ms, 1.3 ms, 1.95 ms</td>
</tr>
<tr>
<td>Sync Offset</td>
<td>100 (adjust as needed)</td>
</tr>
<tr>
<td>Sync Reference</td>
<td>External, Internal, Auto.</td>
</tr>
</tbody>
</table>

### Notes
- For further information about supported 3D formats, see 3D connections in the Connection Guide.
- If 3D Format is set to Off, all other 3D settings will be unavailable.
- Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
- Frame Sequential is supported on the HDMI, DVI-D and DisplayPort inputs only.
- 3D video is only possible on the HDMI, HDBaseT, DisplayPort and DVI inputs.
- The Frame Packing format is automatically detected by the projector.
- See also 3D types and Some 3D settings explained further in this guide.
3D types
In most situations you can use the Auto setting to have the projector automatically detect the format. Otherwise, consider the notes below to help you set up the 3D input manually.

The following 3D formats are supported:

- Dual Pipe (LEFT and RIGHT)
The left and right eye images are delivered on two separate HDMI links, which the projector will interleave for 3D display.

- Frame Packing
This format will be detected, re-synchronised, frame-multiplied and displayed at 96 Hz with the left eye / right eye dominance automatically extracted from the video data. You need to optimize Dark Time and Sync Delay manually to suit your chosen switching glasses.

- Top and Bottom
Sets the projector to reformat the video frames and map them to the display with the left eye / right eye dominance automatically extracted from the video data. You need to optimize Dark Time and Sync Delay manually to suit your chosen switching glasses.

- Side by Side (Half): interlaced and progressive, 50 and 60Hz
The side-by-side image will be de-interlaced (if appropriate), resized and then sequentially displayed at 100 or 120 Hz. The left eye / right eye dominance will be automatically extracted from the video data, however you will need to optimize Dark Time and Sync Delay manually to suit your chosen switching glasses.

Dark Time and Sync Delay need to be set only once, to optimize the image for the glasses in use.
3D menu continued from previous page

Some 3D settings explained

**Dark Time**
Ghosting can be caused by the left and right images overlapping during the time that the ZScreen or 3D glasses are switching. **Dark Time** allows you to minimize this effect.

**Eye Swap**
The outgoing 3D frames are in pairs - the dominant frame being presented first. You can determine which frame should be the dominant one.

By convention the default setting is **Left**.

**Sync Delay**
The sync signal from the 3D server will be in phase with the frames generated by its graphics card. However, to compensate for processing delays in the projector, **Sync Delay** introduces a delay to the sync output signal sent to the ZScreen or 3D glasses.

---

Notes

In order to achieve maximum light output and a smooth grayscale, whilst eliminating ghosting, the following procedure is recommended:

1. Set **Dark Time** to a value appropriate to the glasses or ZScreen, say 1.3 ms or 1.95 ms.
2. Adjust **Sync Offset** time to eliminate ghosting and achieve a smooth grayscale.
3. Repeat steps 1 and 2 until the best result is obtained.
3D menu continued from previous page

**Frame rate multiplication in 3D images**

When displaying a low frame rate 3D video, the projector multiplies the frame rate to obtain a flicker-free image. For example, a 60Hz frame rate is doubled to 120 Hz, or a 48 Hz frame rate is tripled to 144 Hz.

Frame rate multiplication is an automatic process. It occurs in the background and cannot be modified by the user.
**Lamp Control menu**

- **Lamp Selection**
  Choose from **Dual**, **Triple** and **Quad**.

- **Power Mode**
  - **Eco** will automatically set the lamp power to 77%.
  - **Normal** will set the power to 100%.
  - Set to **Custom** if you wish to adjust the power manually.

- **Power Level**
  This setting is only available if **Power Mode** is set to **Custom**.
  Choose a value between 77% and 100%.
Setup menu

• **Orientation**
  Choose from **Front Tabletop, Front Ceiling, Rear Tabletop, Rear Ceiling, Vertical Up** and **Vertical Down**.

• **High Altitude**
  Choose from **On** and **Auto**.

• **Screen Setting**
  Choose from **16:10, 16:9** and **4:3**.

• **ColorMax**
  Set up user-defined color gamut values.

• **Power On/Off**
  Access the submenu to set up automatic projector power on and power off.

• **Clock Adjust**
  Access the submenu to set current date and local time.

• **Startup Logo**
  Set this to **On** if you want the DP logo to show when the projector is first switched on.

• **Blank Screen**
  Choose from **Logo, Black, Blue** and **White**.

• **Trigger1 and Trigger 2**
  Choose from **Off, Screen, 5:4, 4:3, 16:10, 16:9, 1.88, 2.35, TheaterScope, Source, Unscaled** or **RS232** to determine what will cause each trigger output to activate.

• **Auto Source**
  If this setting is **On**, the projector will automatically search for an active input source.

Highlight the DOWN ▼ arrow at the bottom of the page and press ENTER/OK to navigate to the second Setup menu page.

**Notes**

- **Auto-front** automatically detects the projector’s position and sets the orientation accordingly.

- Use **Screen Setting** in combination with the **Aspect Ratio** feature found in the **Geometry** menu to provide the best fit for the projected image and to minimize **letterboxing** and **pillarboxing**.

- **ColorMax** is only available if **Color > Color Mode** is set to **ColorMax**.

- The **Trigger 1** and **Trigger 2** functions output 12 V depending on the set value:
  - **If Screen** is set, the trigger will be activated when the projector is switched on.
  - **If RS232** is set, the trigger will be activated upon receiving a protocol command.
  - **If any of the other values are set**, the trigger will be activated if the **Geometry > Aspect Ratio** function is set to match the trigger value. For example, if **Trigger 1** is set to **4:3**, it will output a 12 V charge if you set **Geometry > Aspect Ratio** to **4:3**.
Setup menu continued from previous page

- **Infrared Remote**
  Set to **Off** if you wish to disable the remote control.

- **IR Code**
  The projector and the remote control need a matching IR code: a two-digit number between **00** and **99**.
  
  The default IR code is **00**. This is also a master code, which, if assigned to a remote, will work regardless of the value assigned to the projector.

  **To assign an IR code for the projector:**
  1. Select **IR Code**.
  2. Use the **UP ▲** and **DOWN ▼** arrow buttons to change the values.

  **To assign an IR code for the remote:**
  1. Press and hold the **ADDR** button on the remote until the indicator starts flashing.
  2. Release the **ADDR** button and while the indicator is still flashing, enter a two-digit address using the numeric input buttons. The indicator will flash three times quickly to confirm the change.

- **IR Code Reset**
  Use this command to unassign an IR code from the projector. This will revert the **IR Code** value to **00**.

  **To unassign an IR code from the remote control,**
  • Press and hold **ALT** and **ADDR** simultaneously until the indicator flashes to confirm the change.

- **OSD Settings**
  Access this submenu to adjust the appearance and position of the on-screen display.

- **Memory**
  Access this submenu to save up to four presets containing custom combinations of image settings, or to recall a saved preset.

Highlight the **UP ▲** arrow at the top of the page and press **ENTER/OK** to go back to the first **Setup** menu page.

---

**Notes**

- If you turn the remote control off, you can only turn it back on again from the control panel or via the **Projector Controller** application.
  
  The **Projector Controller** software is available for download from the Digital Projection website, free of charge.

- A wired remote control will also be disabled if **Infrared Remote** is set to **Off**.
Setup menu continued from previous page

ColorMax Setting

**ColorMax Setting** permits seven point color matching of red, green, blue, yellow, cyan, magenta and white.

You can enter your own gamut values here, or edit values you have imported using the *Projector Controller* software.

Defining your own colorspace with individual x and y coordinates for each color enables you to match not only the whites but each individual color as well.

Highlight the submenu you wish to open and press **ENTER/OK** to confirm your choice.

Measured Data / Target Data

1. Use the UP ▲ and DOWN ▼ arrow buttons to highlight a color, then use the LEFT ◀ and RIGHT ▶ arrow buttons to navigate to the x or y coordinate.

2. Use the UP ▲ and DOWN ▼ arrow buttons to increase and decrease the value, respectively.

3. Exit edit mode:
   - press **ENTER/OK**, if you want to save the edited values.
   - press **EXIT**, if you do not wish to save the edited values

4. If necessary, highlight another color and repeat the procedure.

### Measured Data

<table>
<thead>
<tr>
<th>Color</th>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>0.658</td>
<td>0.339</td>
</tr>
<tr>
<td>Green</td>
<td>0.315</td>
<td>0.662</td>
</tr>
<tr>
<td>Blue</td>
<td>0.146</td>
<td>0.043</td>
</tr>
<tr>
<td>White</td>
<td>0.276</td>
<td>0.283</td>
</tr>
</tbody>
</table>

### Target Data – User 1

<table>
<thead>
<tr>
<th>Color</th>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>0.640</td>
<td>0.390</td>
</tr>
<tr>
<td>Green</td>
<td>0.300</td>
<td>0.600</td>
</tr>
<tr>
<td>Blue</td>
<td>0.150</td>
<td>0.060</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.419</td>
<td>0.505</td>
</tr>
<tr>
<td>Cyan</td>
<td>0.225</td>
<td>0.329</td>
</tr>
<tr>
<td>Magenta</td>
<td>0.321</td>
<td>0.154</td>
</tr>
<tr>
<td>White</td>
<td>0.285</td>
<td>0.302</td>
</tr>
</tbody>
</table>

**Notes**

The *Projector Controller* software is available for download from the Digital Projection website, free of charge.

This tool is best used in conjunction with a specialized light meter (a photo spectrometer) to measure color parameters within a particular installation. However, the preloaded generic factory default data set is designed to give more than satisfactory results.

A Target Data submenu is only available if **Color > ColorMax** is set to **User 1** or **User 2**.
Setup menu continued from previous page

**Power On/Off**
- **Auto Power Off**
  Set this to **On** if you want the projector to go into STANDBY mode when no input source is detected for 20 minutes.

- **Auto Power On**
  Set this to **On** if you want the projector to start up immediately when the mains is connected.
  Set this to **Off** if you want the projector to go into STANDBY mode when the mains is connected. In this case, the projector will not start up until the POWER button is pressed on the control panel or the ON button is pressed on the remote control.

- **Scheduled on/off**
  Access this submenu to create a weekly schedule for automatic on and off times:
  1. Set a schedule:
     - Use the **UP ▲** and **DOWN ▼** arrow buttons to highlight a row, then press **ENTER/OK** to enable edit mode.
     - Within a row, navigate with the **LEFT ◄** and **RIGHT ►** arrow buttons. Set values with the **UP ▲** and **DOWN ▼** arrow buttons.
     - To exit edit mode, press **ENTER/OK**. Alternatively, press **EXIT** if you don’t want the changes to take effect. Move to another row using the **UP ▲** and **DOWN ▼** arrow buttons.
  2. To enable the schedule, set **Schedule** to **On**.

---

Notes

Scheduling only works if **Network > Standby Power** is **On**.

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Off</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>☒</td>
<td>12:34</td>
</tr>
<tr>
<td>Off</td>
<td>☒</td>
<td>12:34</td>
</tr>
<tr>
<td>On</td>
<td>☒</td>
<td>12:34</td>
</tr>
<tr>
<td>Off</td>
<td>☒</td>
<td>12:34</td>
</tr>
</tbody>
</table>
Setup menu continued from previous page

Clock Adjust
Use this menu to set date (in YYYY/MM/DD format), time (in HH:MM format) and time zone.

The date and time set here will affect any schedule created within the Power On/Off menu.

<table>
<thead>
<tr>
<th>Clock Adjust</th>
<th>Date (YYYY/MM/DD)</th>
<th>Time (HH:MM)</th>
<th>Time Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date (YYYY/MM/DD)</td>
<td>2016:11:15</td>
<td>14:00</td>
<td>UTC 0</td>
</tr>
</tbody>
</table>
Setup menu continued from previous page

OSD Settings

- **Language** sets the OSD language.
- **Menu Position** determines where the OSD should appear on the screen when activated.
- **Menu Transparency** sets OSD transparency between 0% (no transparency), 25%, 50% and 75%.
- **Time Out** determines how long the OSD should remain on screen if no buttons are pressed. Choose **Always On** to disable this feature.
- **Message Box** determines whether projector status messages should appear on the screen.

**Memory**

The current image settings can be saved as a preset, which you can recall later. The default settings can be recalled at any time as well.

Up to four custom presets can be stored for each input.

The following settings are saved in a preset:

- From the **Image** menu — **Gamma**, **Brightness**, **Contrast**, **Saturation**, **Hue**, **Sharpness** and **Noise Reduction**
- From the **Color** menu — **Color Space**, **Color Mode**, **ColorMax**, **Color Temperature**, **Dynamic Black**, **RGB Lift** and **RGB Gain**
- From the **Geometry** menu — **Aspect Ratio** and **Overscan**

To recall a saved preset:

- Select **Recall Memory** and press **ENTER/OK**, then select a preset from **Preset A** to **Preset D**. Select **Default** to load factory default values.

To save a preset:

- Select **Save Settings** and press **ENTER/OK**, then choose from **Preset A**, **Preset B**, **Preset C** and **Preset D**.

---

Notes

Presets from one input cannot be applied to another input.
**Network menu**

- **Network Mode**
  Choose between **Projector Control** and **Service**.

- **Standby Power**
  If this setting is **On**, the LAN socket remains active when the projector is in STANDBY mode. If the setting is **Off**, the LAN socket is disabled when the projector is in STANDBY mode.

- **DHCP, IP, Subnet Mask, Gateway, DNS**
  Set **DHCP** to **On** if the IP address is to be assigned by a DHCP server, or **Off** if it is to be set here.
  
  If **DHCP** is **On**, it will not be possible to edit **IP Address**, **Subnet Mask**, **Gateway** or **DNS**.
  
  If **DHCP** is set to **Off**, edit **IP Address**, **Subnet Mask**, **Gateway** and **DNS** as required.

- **MAC**
  This field is read-only.

- **AMX**
  When this feature is enabled the projector sends status updates to AMX approximately every 30 seconds.
**PIP menu**

- **PIP**
  
  Turn PIP on and off.

- **Source**
  
  Select an input source for the PIP image.
  
  Any combinations are possible between main and PIP input source, as long as:
  
  - one of the inputs is **HDMI 2** - regardless whether it is used for main or PIP source
  - **DisplayPort**, if used, is at a pixel rate below 165 MHz.

- **Position**
  
  Set the location of the PIP image on the screen. Choose from **Top-Left**, **Top-Right**, **Bottom-Left**, **Bottom-Right** and **PBP**.

---

**Notes**

Some settings may be unavailable depending on other settings. For more information, see Possible Combinations Of Settings further in this guide.
Information menu
This menu gives information about software and hardware configuration, input source and laser operating times. It also allows you to restore the factory default settings.

<table>
<thead>
<tr>
<th>Information</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Name</td>
<td>Mercury Quad WUXGA</td>
</tr>
<tr>
<td>Serial Number</td>
<td>X000XXXXX0000</td>
</tr>
<tr>
<td>Software Version 1</td>
<td>MD03-SE10-FE09</td>
</tr>
<tr>
<td>Software Version 2</td>
<td>LE07-14-RE04-3092</td>
</tr>
<tr>
<td>Active / PIP Source</td>
<td>HDMI2 / HDMI1</td>
</tr>
<tr>
<td>Signal Format</td>
<td></td>
</tr>
<tr>
<td>Lamp Hours</td>
<td>0011/0013/0011/0013 HRS</td>
</tr>
<tr>
<td>System Status</td>
<td></td>
</tr>
<tr>
<td>Thermal Status</td>
<td></td>
</tr>
<tr>
<td>Factory Reset</td>
<td></td>
</tr>
</tbody>
</table>

Signal Format

<table>
<thead>
<tr>
<th>Signal Format</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Source</td>
<td></td>
</tr>
<tr>
<td>Timing</td>
<td>1080p/60Hz</td>
</tr>
<tr>
<td>H Refresh</td>
<td>67.500 KHz</td>
</tr>
<tr>
<td>V Refresh</td>
<td>60.00 Hz</td>
</tr>
<tr>
<td>Pixel Clock</td>
<td>148.500 MHz</td>
</tr>
<tr>
<td>PIP Source</td>
<td></td>
</tr>
<tr>
<td>Timing</td>
<td>576p/50Hz</td>
</tr>
<tr>
<td>H Refresh</td>
<td>31.250 KHz</td>
</tr>
<tr>
<td>V Refresh</td>
<td>50.00 Hz</td>
</tr>
<tr>
<td>Pixel Clock</td>
<td>27.0 MHz</td>
</tr>
</tbody>
</table>
**System Status**

<table>
<thead>
<tr>
<th>System Status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamp Selection</td>
<td>Quad</td>
</tr>
<tr>
<td>Atmospheric Pressure</td>
<td>98988 Pa (116 m)</td>
</tr>
<tr>
<td>AC Voltage</td>
<td>160V – 264V</td>
</tr>
<tr>
<td>Altitude Mode</td>
<td>Low</td>
</tr>
<tr>
<td>Lamp Power</td>
<td>100%</td>
</tr>
<tr>
<td>Lamp 1 Hours</td>
<td>0012 HRS</td>
</tr>
<tr>
<td>Lamp 2 Hours</td>
<td>0014 HRS</td>
</tr>
<tr>
<td>Lamp 3 Hours</td>
<td>0012 HRS</td>
</tr>
<tr>
<td>Lamp 4 Hours</td>
<td>0013 HRS</td>
</tr>
<tr>
<td>Lamp Status</td>
<td>On / On / On / On</td>
</tr>
</tbody>
</table>

**Thermal Status**

<table>
<thead>
<tr>
<th>Thermal Status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet Temp.</td>
<td>24</td>
</tr>
<tr>
<td>DMD Temp.</td>
<td>38 (C)</td>
</tr>
<tr>
<td>Lamp Voltage</td>
<td>84 / 84 / 83 / 84</td>
</tr>
<tr>
<td>Fan 1-3 Speed</td>
<td>1399 / 1402 / 1391</td>
</tr>
<tr>
<td>Fan 4-6 Speed</td>
<td>1410 / 1200 / 1205</td>
</tr>
<tr>
<td>Fan 7-9 Speed</td>
<td>1211 / 1407 / 1410</td>
</tr>
<tr>
<td>Fan 10-12 Speed</td>
<td>0 / 3005 / 3007</td>
</tr>
<tr>
<td>Fan 13-15 Speed</td>
<td>2986 / 2984 / 2984</td>
</tr>
<tr>
<td>Fan 16-18 Speed</td>
<td>3020 / 2014 / 2014</td>
</tr>
<tr>
<td>Fan 19-21 Speed</td>
<td>3506 / 5330 / 3998</td>
</tr>
<tr>
<td>Fan 22-24 Speed</td>
<td>3985 / 5207 / 5123</td>
</tr>
<tr>
<td>Fan 25-26 Speed</td>
<td>4584 / 4404</td>
</tr>
</tbody>
</table>

Notes
Information menu continued from previous page

**Factory Reset**

To restore the factory default settings:

1. Navigate to **Factory Reset** and press **ENTER/OK**.
2. When prompted, press **ENTER/OK** to confirm your choice, or press **EXIT** to cancel.

---

**Notes**

<table>
<thead>
<tr>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model Name</strong></td>
</tr>
<tr>
<td><strong>Serial Number</strong></td>
</tr>
<tr>
<td><strong>Software Version 1</strong></td>
</tr>
</tbody>
</table>

**Factory Reset**

**WARNING**
All user settings will be lost!

Press OK to confirm
Press Exit to cancel

**Thermal Status**

**Factory Reset** OK
Some OSD settings cannot be used in combination with others. The table below shows the possible combinations.

A tick (✓) means that the combination is possible. A cross (×) means applying the new setting is impossible if the existing setting is being used. A number sign (#) means applying the new setting will disable the existing one.

<table>
<thead>
<tr>
<th>Existing Setting</th>
<th>New Setting</th>
<th>3D</th>
<th>Warp / Geometry</th>
<th>Blending</th>
<th>Picture Mode</th>
<th>Color Temp.</th>
<th>Overscan</th>
<th>Aspect Ratio</th>
<th>Digital Zoom</th>
<th>PIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>Warp / Geometry</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Blending</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Picture Mode</td>
<td>#</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Color Temp.</td>
<td>#</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Overscan</td>
<td>#</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aspect Ratio</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Digital Zoom</td>
<td>#</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PIP</td>
<td>#</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Notes
Web Configuration Utility

Use the embedded Web Configuration Utility to control the projector via a LAN network:

1. Make sure the projector is connected to a remote computer via LAN.
2. From the remote computer, access the LAN IP address of the projector. The Web Configuration Utility opens.

The utility’s features are arranged in the following tabs:

1. **Projector Status**
   - View projector and network information.

2. **Projector Control**
   - Access various projector settings.

3. **Network Setup**
   - View and configure network settings.

4. **Alert Mail Setup**
   - Set up error warnings and regular status reports by email.

**Notes**

The default LAN IP address is 192.168.0.100.

If you suspect this has been changed, view the current Network settings in the Setup menu.

For more information about connecting the projector via LAN, see the Connection Guide.
**Projector Control page**
From this page you can do the following:

- Switch the projector on and off (**Power**)
- Enable and disable the shutter (**Blank**)
- Select input source (**Input Selection**)
- Zoom, focus and shift the image (**Lens Control**)

**Notes**

*If Standby Power is set to Off, the LAN connection will be disabled when the projector is in STANDBY mode. To enable power on via LAN, set Network > Standby Power to On.*
**Network Setup page**
From this page you can view and configure network settings.

**Notes**
Changing network settings is only possible if DHCP is set to Off.
Alert Email Setup page

To receive error warnings and status reports by email:

1. Navigate to the Alert Mail Setup tab.

2. Enter user credentials, SMTP settings, email addresses and preferences as required.

   Optionally, click Send Test Mail to test your email settings.

For assistance with your network settings, consult your network administrator.
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A DMD™ (Digital Micromirror Device™) is a true digital light modulator which utilises an array of up to 2.3 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.

- **Casing**
- **Light shield**
- **Pond of mirrors**
- **Array**

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

- **Support posts**
- **Mirror element**
- **Torsion hinges**
- **Offset address electrode**
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.

![Light flow diagram](image)

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.

![Filtering process diagram](image)
# 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:

<table>
<thead>
<tr>
<th>Throw ratio</th>
<th>Throw distance range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.67:1 fixed lens</td>
<td>1.1 m - 10 m (3.6 ft - 33 ft)</td>
</tr>
<tr>
<td>1.12:1 fixed lens</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
</tr>
<tr>
<td>1.16 - 1.49:1 zoom lens</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
</tr>
<tr>
<td>1.39 - 1.87:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>1.87 - 2.56:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>2.56 - 4.16:1 zoom lens</td>
<td>9.1 m - 45 m (29.9 ft - 147.6 ft)</td>
</tr>
<tr>
<td>4.16 - 6.96:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
<tr>
<td>6.92 - 10.36:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
</tbody>
</table>

To choose a lens, either calculate the throw ratio required, or use the lens charts provided in Appendix B at the end of this document.
Basic calculation

Identify the required lens by calculating the throw ratio.

A throw ratio is the ratio of the throw distance to the screen width:

\[
\text{Throw ratio} = \frac{\text{Throw distance}}{\text{Screen width}}
\]

1. Use the formula above to obtain the required throw ratio.
2. Match the throw ratio with a lens from the table below:

<table>
<thead>
<tr>
<th>Throw ratio</th>
<th>Throw distance range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.67:1 fixed lens</td>
<td>1.1 m - 10 m (3.6 ft - 33 ft)</td>
</tr>
<tr>
<td>1.12:1 fixed lens</td>
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<tr>
<td>1.39 - 1.87:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>1.87 - 2.56:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>2.56 - 4.16:1 zoom lens</td>
<td>9.1 m - 45 m (29.9 ft - 147.6 ft)</td>
</tr>
<tr>
<td>4.16 - 6.96:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
<tr>
<td>6.92 - 10.36:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
</tbody>
</table>

3. Ensure the required throw distance is within the range covered by the lens.

Notes

The basic calculation on this page does not take into consideration DMD™ and image size, which could affect the throw ratio. For a more complex and realistic calculation, see Full lens calculation in this section.

When calculating the throw ratio, be sure to use identical measurement units for both the throw distance and the screen width.

For information about individual lens part numbers, see Appendix A at the end of this document.
Basic calculation example

1. Calculate the throw ratio using the formula.
   Your screen is 4.5 m wide and you wish to place the projector approximately 11 m from the screen. The throw ratio will then be
   \[
   \frac{11}{4.5} = 2.44
   \]

2. Match the result with the lens table.
   The lens matching a throw ratio of 2.44 is the 1.87 - 2.56 : 1 zoom lens.

3. Check whether the lens covers the required throw distance.
   The range quoted for the 1.87 - 2.56 : 1 zoom lens is 4 - 24 m. The required distance of 11 m is within the range.

INFORMATION YOU NEED FOR THIS CALCULATION

- The throw ratio formula:
  \[\text{Throw ratio} = \frac{\text{Throw distance}}{\text{Screen width}}\]

- The lens table:

<table>
<thead>
<tr>
<th>Throw ratio</th>
<th>Throw distance range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.67:1 fixed lens</td>
<td>1.1 m - 10 m (3.6 ft - 33 ft)</td>
</tr>
<tr>
<td>1.12:1 fixed lens</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
</tr>
<tr>
<td>1.16 - 1.49:1 zoom lens</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
</tr>
<tr>
<td>1.39 - 1.87:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>1.87 - 2.56:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>2.56 - 4.16:1 zoom lens</td>
<td>9.1 m - 45 m (29.9 ft - 147.6 ft)</td>
</tr>
<tr>
<td>4.16 - 6.96:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
<tr>
<td>6.92 - 10.36:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
</tbody>
</table>

Notes

The basic calculation on this page does not take into consideration DMD™ and image size, which could affect the throw ratio. For a more complex and realistic calculation, see Full lens calculation in this section.

For information about individual lens part numbers, see Appendix A at the end of this document.
**Full lens calculation**

**Introducing TRC**

The choice of lens will affect the image size and will address discrepancies between the DMD™ resolution and the source.

When an image fills the height of the DMD™ but not the width, it uses less than 100% of the DMD™ surface. A lens chosen using the basic formula may produce an image that is considerably smaller than the actual screen.

To compensate for loss of screen space in such situations, you need to increase the throw ratio using a **Throw Ratio Correction (TRC)**.

**Example**

Fig. 1 illustrates a 4:3 image within a WUXGA DMD™.

When a WUXGA projector is used for a 4:3 image, the image does not fill the width of the DMD™, creating a **pillarboxing** effect - blank spaces to the left and right.

Fig. 2 shows the same image projected on a 4:3 screen using a standard lens (chosen with the basic calculation).

The DMD™ accurately fills the width of the screen; however, the pillarboxing is now part of the projected image and is transferred to the screen.

The DMD™ does not fill the height of the screen, which has caused **letterboxing** - further blank spaces at the top and bottom of the screen.

The image is now surrounded by blank space, which can be removed if the throw ratio is increased.

Fig. 3 shows the image projected on the same screen with a lens chosen using TRC.

The increased throw ratio has allowed the 4:3 image to fill the 4:3 screen seamlessly.

---

**Notes**

TRC can only be applied if greater than 1. If TRC is 1 or less, disregard it and calculate the throw ratio using the basic formula.
Calculating TRC
To calculate TRC, use the following formula:

\[
TRC = \frac{1.6 \ (DMD^\text{™} \ aspect \ ratio)}{\text{Source \ aspect \ ratio}}
\]

TRC table
Alternatively, you can save time by referencing the following table, which shows the TRC value for some popular image formats:

<table>
<thead>
<tr>
<th>Aspect Ratio</th>
<th>Width x Height</th>
<th>TRC or Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.35:1 (Scope), 1920 x 817 pixels</td>
<td>TRC &lt; 1, not used</td>
<td></td>
</tr>
<tr>
<td>1.85:1 (Flat), 1920 x 1037 pixels</td>
<td>TRC &lt; 1, not used</td>
<td></td>
</tr>
<tr>
<td>1.78:1 (16:9), 1920 x 1080</td>
<td>TRC &lt; 1, not used</td>
<td></td>
</tr>
<tr>
<td>1.66:1 (Vista), 1792 x 1080 pixels</td>
<td>TRC &lt; 1, not used</td>
<td></td>
</tr>
<tr>
<td>1.6:1 (16:10), 1728 x 1080 pixels</td>
<td>TRC = 1, not used (native resolution)</td>
<td></td>
</tr>
<tr>
<td>1.33:1 (4:3), 1440 x 1080 pixels</td>
<td>TRC = 1.2</td>
<td></td>
</tr>
<tr>
<td>1.25:1 (5:4), 1350 x 1080 pixels</td>
<td>TRC = 1.28</td>
<td></td>
</tr>
</tbody>
</table>

Notes
TRC can only be applied if greater than 1. If TRC is 1 or less, disregard it and calculate the throw ratio using the basic formula.
Calculating the throw ratio with TRC

1. For TRC > 1, amend the basic throw ratio formula as follows:

\[
\text{Throw ratio} = \frac{\text{Throw distance}}{\text{Screen width} \times \text{TRC}}
\]

2. Once a throw ratio is established, identify the matching lens from the table:

<table>
<thead>
<tr>
<th>Throw ratio</th>
<th>Throw distance range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.67:1 fixed lens</td>
<td>1.1 m - 10 m (3.6 ft - 33 ft)</td>
</tr>
<tr>
<td>1.12:1 fixed lens</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
</tr>
<tr>
<td>1.16 - 1.49:1 zoom lens</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
</tr>
<tr>
<td>1.39 - 1.87:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>1.87 - 2.56:1 zoom lens</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
</tr>
<tr>
<td>2.56 - 4.16:1 zoom lens</td>
<td>9.1 m - 45 m (29.9 ft - 147.6 ft)</td>
</tr>
<tr>
<td>4.16 - 6.96:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
<tr>
<td>6.92 - 10.36:1 zoom lens</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
</tbody>
</table>

3. Ensure the required throw distance is within the range of the matching lens.

Notes

TRC can only be applied if greater than 1. If TRC is 1 or less, disregard it and calculate the throw ratio using the basic formula.
Full lens calculation example

Your screen is 4.5 m wide; you wish to place the projector approximately 11 m from the screen. The source is 4:3.

1. Calculate TRC as follows:
   \[ TRC = \frac{1.6}{1.33} = 1.2 \]

2. Calculate the throw ratio:
   \[ \text{Throw ratio} = \frac{11}{4.5 \times 1.2} = 2.04 \]

3. Find a match in the lens table.
   The table shows that the matching lens is the **1.87 - 2.56 : 1 zoom lens**.

4. Check whether the lens covers the required throw distance.
   The range quoted for the 1.87 - 2.56 : 1 zoom lens is 4 - 24 m. The required distance of 11 m is within the range.

---

**INFORMATION YOU NEED FOR THESE CALCULATIONS**

- The TRC formula
  \[ TRC = \frac{\text{DMD™ aspect ratio}}{\text{Source aspect ratio}} \]

- The TRC table (to use instead of the formula)
<table>
<thead>
<tr>
<th>TRC</th>
<th>Source aspect ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.35:1 (Scope)</td>
<td>TRC not used</td>
</tr>
<tr>
<td>1.85:1 (Flat)</td>
<td>TRC not used</td>
</tr>
<tr>
<td>1.78:1 (16:9)</td>
<td>TRC not used</td>
</tr>
<tr>
<td>1.66:1 (Vista)</td>
<td>TRC not used</td>
</tr>
<tr>
<td>1.6:1 (16:10)</td>
<td>TRC not used (native resolution)</td>
</tr>
<tr>
<td>1.33:1 (4:3)</td>
<td>TRC = 1.2</td>
</tr>
<tr>
<td>1.25:1 (5:4)</td>
<td>TRC = 1.28</td>
</tr>
</tbody>
</table>

- The throw ratio formula
  \[ \text{Throw ratio} = \frac{\text{Throw distance}}{\text{Screen width} \times \text{TRC}} \]

- The lens table:

<table>
<thead>
<tr>
<th>Throw ratio</th>
<th>Throw distance range</th>
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<tbody>
<tr>
<td>0.67:1 fixed lens</td>
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<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
</tr>
</tbody>
</table>
**Screen Requirements**

**Fitting the image to the DMD™**

If the source image supplied to the projector is smaller than the DMD™ resolution, the image will not fill the DMD™. The following examples show how a number of common formats may be displayed, depending on your DMD™ resolution.

**WUXGA images displayed full width**

- Full width = 1920 pixels
- 2.35:1 (Scope) = 817 pixels
- 1.85:1 = 1037 pixels
- 16:9 = 1080 pixels
- Full height = 1200 pixels

Notes
WUXGA images displayed with a height of 1080 pixels

- 4:3 = 1.33:1 = 1440 pixels
- 16:10 = 1.6:1 = 1728 pixels
- 1.66:1 (Vista) = 1792 pixels
- full width = 1920 pixels

max possible image height = 1080 pixels
full height = 1200 pixels

Notes
**WUXGA images displayed full height**

- **UXGA** = 4:3 = 1.33:1 = 1600 pixels
- **WUXGA** = 16:10 = 1.6:1 = 1920 pixels

**Notes**

Only WUXGA or UXGA images can fill the full height of the DMD™, using all 1200 pixels without scaling.
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.

2.35:1 (Scope)
\[ W = D \times 0.92 \quad H = D \times 0.39 \]

1.85:1
\[ W = D \times 0.88 \quad H = D \times 0.47 \]

16:9 = 1.78:1
\[ W = D \times 0.87 \quad H = D \times 0.49 \]

1.66:1 (Vista)
\[ W = D \times 0.86 \quad H = D \times 0.52 \]

16:10 = 1.6:1 (native aspect ratio for WUXGA projectors)
\[ W = D \times 0.85 \quad H = D \times 0.53 \]
**Fitting the image to the screen**

It is important that your screen is of sufficient height and width to display images at all the aspect ratios you are planning to use.

Use the conversion chart to check that you are able to display the full image on your screen. If you have insufficient height or width, you will have to reduce the overall image size in order to display the full image on your screen.

1. **4:3 = 1.33:1**
   \[ W = H \times 1.33, \quad H = W \times 0.75 \]

2. **16:10 = 1.6:1**  
   (native aspect ratio for WUXGA projectors)  
   \[ W = H \times 1.6, \quad H = W \times 0.625 \]

3. **1.66:1 (Vista)**  
   \[ W = H \times 1.66, \quad H = W \times 0.6 \]

4. **16:9 = 1.78:1**  
   \[ W = H \times 1.78, \quad H = W \times 0.56 \]

5. **1.85:1 (Flat)**  
   \[ W = H \times 1.85, \quad H = W \times 0.54 \]

6. **2.35:1 (Scope)**  
   \[ W = H \times 2.35, \quad H = W \times 0.426 \]
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 (see Setup menu in the Operating Guide) 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.

![Diagram: Shifting the lens up (rising front)]

**Shifting the lens up (rising front)**

![Diagram: Centered lens]

**Centered lens**

![Diagram: Shifting the lens down (falling front)]

**Shifting the lens down (falling front)**

---

**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*

For more information on shifting the lens, see *Lens control* in the Operating Guide.
**Maximum offset range**
The maximum offset range available with no distortion or vignetting is dependent on which lens is used. Shifting the lens beyond its undistorted limits may be physically possible, however you may experience some vignetting or distortion.

<table>
<thead>
<tr>
<th>Throw ratio</th>
<th>Lens shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.67:1 fixed lens</td>
<td>Vert: 0.108 (U) 0.108 (D) frame, Hor: 0.044 (L) 0.044 (R) frame</td>
</tr>
<tr>
<td>1.12:1 fixed lens</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>1.16 - 1.49:1 zoom lens</td>
<td>Vert: 0.408 (U) 0.408 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>1.39 - 1.87:1 zoom lens</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
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<td>1.87 - 2.56:1 zoom lens</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>2.56 - 4.16:1 zoom lens</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>4.16 - 6.96:1 zoom lens</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>6.92 - 10.36:1 zoom lens</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
</tbody>
</table>

**Notes**
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 a combination of the following:

- The DMD™ resolution is **WUXGA** with a 1920 x 1200 resolution, corresponding to an aspect ratio of 16:10
- The aspect ratio of the input signal: usually **4:3**, **16:9** or **16:10**
- The value of the **Aspect Ratio** setting of the projector:
  - **16:9**, **4:3**, **16:10** and **5:4** stretch the image to the selected aspect ratio. **16:9** leaves black bars at the top and bottom of the screen (letterboxing effect); **4:3** and **5:4** leave black bars at the sides of the screen (pillarboxing).
  - **TheaterScope** is a special setting used in combination with an anamorphic lens, an optional accessory. It removes letterboxing from a 2.35:1 source packed into a 16:9 frame.
  - **4:3 Narrow** is a special setting used in combination with an anamorphic lens, an optional accessory. It squeezes 4:3 content so that the intended aspect ratio is displayed on screen when projected through an anamorphic lens.
  - **Source** shows the image with its original aspect ratio, not using the whole screen if the DMD™ aspect ratio does not match. The image is scaled to fit either the full width or height of the screen.
**Aspect ratio examples**

Source: 4:3

Aspect Ratio: Source / 4:3

Aspect Ratio: 16:10

Source: 16:9

Aspect Ratio: Source / 16:9

Aspect Ratio: 16:10

Source: 16:10 (native)

Aspect Ratio: Source / 16:10

Unused screen areas

Notes
Aspect ratio example: TheaterScope

The TheaterScope setting is used in combination with an anamorphic lens to restore 2.35:1 images packed into a 16:9 frame. Such images are projected with black lines at the top and bottom of the 16:9 screen to make up for the difference in aspect ratios.

Without an anamorphic lens and without the TheaterScope setting applied, a 16:9 source containing a 2.35:1 image looks like this:

If we change the setting to TheaterScope, the black lines will disappear but the image will stretch vertically to reach the top and bottom of the DMD™:

An anamorphic lens will stretch the image horizontally, restoring the original 2.35 ratio:
Frame Rates And Pulldowns Explained

Interlaced and progressive scan
A progressive scan is a method of updating the image by drawing all the lines of each frame in a sequence. In contrast, interlaced video alternately scans odd and even lines. In old analog TV interlacing was commonly used as a way of doubling the refresh rate without consuming extra bandwidth.

The following artifacts are common with interlaced video:
- edge tear (combing)
  The image lands between two fields and blurs. This is commonly observed when viewing rapid lateral movement.
- aliasing (stair-stepping)
  The texture of the image becomes populated with unrealistic patterns. Aliasing occurs because of differences between the original frame rate and the destination format.
- twitter
  The image shimmers, for example when showing rolling credits. This happens when the image contains thin horizontal lines that only appear in one field.

Frame rates of image sources
Original analog films are made at 24 fps and the whole frame is projected at once. To eliminate flicker and create an impression of continuous movement, the projector blades divide the images so that the viewer sees 48 frames per second.

Interlaced video scans odd lines, then even. Two fields are blended into one image. NTSC video (60i) is 29.97 fps, or 59.94 fields per second.

24p video is progressive but without the benefit of projector blades dividing the images, so it looks jumpier on playback than film. 24p is the optimal format for projects that are finished on film.

30p is optimal for projects finished on video. It has fewer strobing issues than 24p in video playback.
Pulldowns - conversion into destination formats

Pulldowns are a method of converting a 24p source into a different destination format by adding extra frames to the source.

2:3 (normal) pulldown

This method is used to convert a 24p source (film) into a 60i destination (NTSC video) by adding two extra fields for every four frames, effectively increasing the frame rate to 30 fps. The frame is split into fields and then two fields are repeated for every four original frames as shown in the illustration below.

<table>
<thead>
<tr>
<th>Original film, 24 fps</th>
<th>Field 1 (odd)</th>
<th>Field 2 (even)</th>
<th>Resulting video, 30 fps</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

Notes
2:3:3:2 (advanced) pulldown

This method is very similar to the normal pulldown. Unlike the normal pulldown method, the resulting 30 fps video sequence contains only one frame containing fields from two different source frames.

The advantage of this method is that it is easier to reverse, if necessary.

Notes

The projector will use advanced pulldown on suitable video material, wherever possible.
## Appendix A: Lens Part Numbers

<table>
<thead>
<tr>
<th>Throw ratio</th>
<th>Part number</th>
<th>Throw distance range</th>
<th>Lens shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.67:1 fixed lens</td>
<td>105-607</td>
<td>1.1 m - 10 m (3.6 ft - 33 ft)</td>
<td>Vert: 0.108 (U) 0.108 (D) frame, Hor: 0.044 (L) 0.044 (R) frame</td>
</tr>
<tr>
<td>1.12:1 fixed lens</td>
<td>105-608</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>1.16 - 1.49:1 zoom lens</td>
<td>109-236</td>
<td>3 m - 15 m (9.8 ft - 49.2 ft)</td>
<td>Vert: 0.408 (U) 0.408 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>1.39 - 1.87:1 zoom lens</td>
<td>105-610</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>1.87 - 2.56:1 zoom lens</td>
<td>105-611</td>
<td>4 m - 24 m (13.1 ft - 78.7 ft)</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>2.56 - 4.16:1 zoom lens</td>
<td>105-612</td>
<td>9.1 m - 45 m (29.9 ft - 147.6 ft)</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
</tr>
<tr>
<td>4.16 - 6.96:1 zoom lens</td>
<td>105-613</td>
<td>12 m - 80 m (39.3 ft - 262.5 ft)</td>
<td>Vert: 0.567 (U) 0.45 (D) frame, Hor: 0.188 (L) 0.188 (R) frame</td>
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</table>

### Notes

- The throw ratios given here apply only when the image fills the width of the DMD™.
- For images that do not fill the width of the DMD™, the throw ratio needs to be recalculated using a throw ratio correction (TRC).
- For further information, see Choosing A Lens.

- Throw distance calculations are based on the distance from the outer end of the lens, which will vary from lens to lens.
### Appendix B: Supported Signal Input Modes

#### 2D formats

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**Notes**
### APPENDIX B: SUPPORTED SIGNAL INPUT MODES

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# APPENDIX B: SUPPORTED SIGNAL INPUT MODES

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## 3D formats

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**Notes**

*1: Based on IT6802 chip specification
*2: Based on IT6535 chip specification
*3: HBLL (High Bandwidth Low Latency) mode without warping/blending.
*4: 8-bit / color.
## Digital Projection Mercury Quad Series

### APPENDIX B: SUPPORTED SIGNAL INPUT MODES

<table>
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### Notes

Remarks:
- *1: Based on IT6802 chip specification
- *2: Based on IT6535 chip specification
- *3: HBLL (High Bandwidth Low Latency) mode without warping/blending.
- *4: 8-bit / color.
Appendix C: Wiring Details

Signal inputs and outputs

HDMI 1 and 2

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
### DisplayPort

**DisplayPort 1.1a**

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<td>15</td>
<td>AUX CH (p)</td>
<td>Auxiliary Channel (positive)</td>
</tr>
<tr>
<td>16</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>17</td>
<td>AUX CH (n)</td>
<td>Auxiliary Channel (negative)</td>
</tr>
<tr>
<td>18</td>
<td>Hot Plug</td>
<td>Hot Plug Detect</td>
</tr>
<tr>
<td>19</td>
<td>Return</td>
<td>Return for Power</td>
</tr>
<tr>
<td>20</td>
<td>DP_PWR</td>
<td>Power for connector (3.3 V 500 mA)</td>
</tr>
</tbody>
</table>

[DisplayPort: pin view of panel connector]
**3G-SDI In, 3G-SDI Out**

75 ohm BNC

![3G-SDI connector](image)

**HDBaseT input**

RJ45 socket.

![HDBaseT input](image)

**Notes**

- 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 √f, from 1 MHz, to 3 GHz.*

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

LAN
RJ45 socket
(Shared with HDBaseT)

RS232
9 way D-type connector
1 unused
2 Received Data (RX)
3 Transmitted Data (TX)
4 unused
5 Signal Ground
6 unused
7 unused
8 unused
9 unused

Notes
Only one remote connection (RS232 or LAN) should be used at any one time.
Trigger 1 & Trigger 2
3.5 mm mini jack
Tip Signal
Sleeve Ground
Output: 12V, 200 mA max

IR input
3.5 mm mini jack
Tip Power
Ring Signal
Sleeve Ground
Output: 3.3V ±5%, 500 mA max

3D Sync IN and 3D Sync OUT
75 ohm BNC
Sync OUT output voltage 5V
Sync IN input voltage 3.3V~5V
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<table>
<thead>
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<tr>
<td>Greenside Way, Middleton Manchester M24 1XX, UK</td>
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<td>中国 北京市 朝阳区 莎奥居北里101号 世奥国际中心A座2006室(100029)</td>
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