



A Delta Associate Company

E-Vision 4000 Series

High Brightness Digital Video Projector

INSTALLATION & QUICK START GUIDE

CONNECTION GUIDE

OPERATING GUIDE

REFERENCE GUIDE

121-815A

Introduction

Notes

Congratulations on your purchase of this Digital Projection product. Your projector has the following key features:

- 4K-UHD projector.
- Displays 4K-UHD with smooth picture processing.
- Up to 1,300:1 native contrast ratio, and up to 500,000:1 with Advanced Black.
- Long life laser light source
- 24/7 Operation
- Rec 709 color gamut capability
- HDBaseT® for transmission of uncompressed High Definition Video up to 100 m from the source.
- Vertical Keystone geometry correction.
- Control via LAN HDBaseT and RS232.
- Aspect Ratio control.
- Constant brightness mode maintains light output at selected levels.
- Built in speaker

A serial number is located on the rear of the projector. Please record it here for future reference:

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

About this document

Symbols used in this document

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



LASER WARNING: this symbol indicates that there is a potential hazard of eye exposure to laser radiation 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.



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.



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.

Additional Documentation

Updates to this manual may be available online.

Please use the QR code (also located on the projector) to access the latest E-Vision projector user guides and other documentation via the Digital Projection website.

Or visit the Digital Projection website to download the latest user guide and other documentation.



Legal notice


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Notes

Electrical and Physical Specifications

Mains Voltage	100-240VAC 50/60Hz 6.0A
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-10°C to 60°C (14°F to 140°F)
Operating Humidity	10% to 85% non-condensing
Storage Humidity	5% to 95% non-condensing
Dimensions	L: 405mm (15.94in) X W: 480mm (18.89in) X H: 180mm (7.09in)
Weight	12Kg (26.45lb) including lens
Power Consumption	at 100VAC: 570W typical (normal mode) at 240VAC: 538W typical (normal mode)
Standby Power	<0.5W (Network Off), <2W (Network On)
Thermal Dissipation	at 100VAC: 1945 BTU/Hour typical (Normal mode) at 240VAC: 1836 BTU/Hour typical (Normal mode)
Fan Noise	35dBA typical, 37dBA max (Normal mode)

 Specifications are subject to change without notice.

Laser Parameters

Wavelength	449-461nm (Blue)
Mode of operation	Pulsed, due to frame rate
Pulse duration	1.34ms
Maximum pulse energy	0.698mJ

Notes



The projector switches to ECO mode with a reduced light output when the operating temperature is between 35°C and 40°C (95°F to 104°F)

Compliance with International Standards**RF Interference**

FCC

The Federal Communications Commission does not allow any modifications or changes to the unit EXCEPT those specified by Digital Projection in this manual. Failure to comply with this government regulation could void your right to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference.

Noise

GSGV Acoustic Noise Information Ordinance

The sound pressure level is less than 38 dB (A) at normal operating mode according to ISO 3744 or ISO 7779.

European Waste Electrical and Electronic Equipment (WEEE) Directive

Digital Projection Ltd is fully committed to minimizing Waste Electrical and Electronic Equipment. Our products are designed with reuse, recycling and recovery of all components in mind. To this end, at end of life, your projector may be returned to Digital Projection Ltd or its agent so that the environmental impact can be minimized.

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A Delta Associate Company

E-Vision 4000 Series

High Brightness Digital Video Projector

INSTALLATION & QUICK START GUIDE

121-815A


General Precautions*Notes*

 **Warning! Death or Serious Injury could occur if the following precautions are ignored**

 **Eye Hazard! Do not look directly into the lens when the light source is on. The high brightness can cause permanent eye damage**

 **Fire Hazard! Keep any combustible material away from hot surfaces and the projected beam. Ensure cables do not contact hot surfaces**

 **Shock Hazard! Use only authored components, tools, accessories and replacement parts specified by the manufacturer**

 **Trip Hazard! Locate cables where they cannot be pulled, tripped over or damaged by persons or objects**

Operate the product in the specified operating environment and conditions


Product should be powered off and disconnected from the mains before any service or maintenance operation

Keep body parts, hair, clothing and jewellery away from moving parts in the product.

Do not operate the product without a lens installed

Use a lens plug when installing or moving the product

 **The unit is never to be operated if the unit is defective or the cover or seal is damaged.**

 **No maintenance allowed by end user.**

Do not open the cabinet. There are no user serviceable parts inside.


No service is allowed except by authorized personnel.

 **Service personnel should use effective laser safety goggles during service operations.**

 **Use only the power cable provided.**

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

 **Take care to prevent small objects such as paper or wire from falling into the projector. If this does happen, switch off immediately, and have the objects removed by authorized service personnel.**

 **Do not expose the projector to rain or moisture, and do not place any liquids on top of the projector.**

Unplug before cleaning, and use a damp, not wet, cloth.

Do not touch the power plug with wet hands.

Do not touch the power plug during a thunder storm.

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



Do not touch the ventilation outlets, as they will become hot in use.

Do not cover or obstruct the ventilation outlets or inlets.

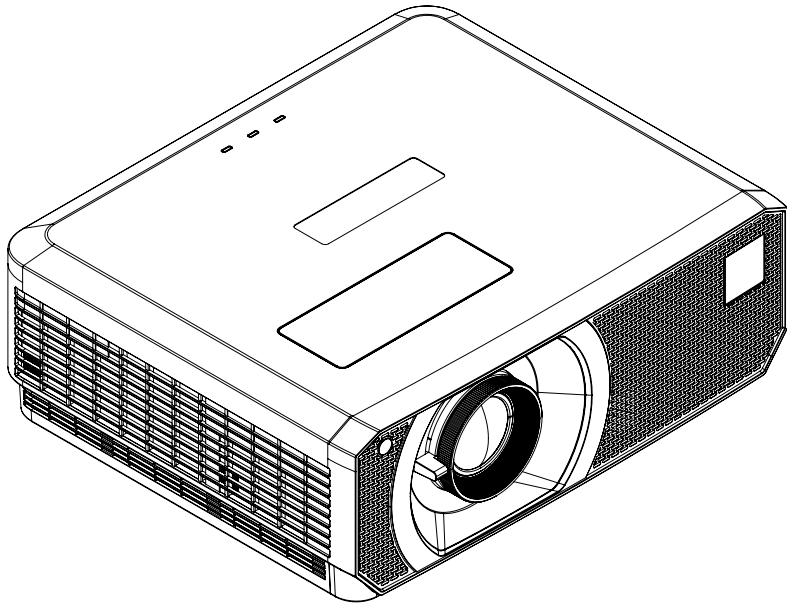
Do not cover the lens whilst the projector is switched on. This could cause a fire.

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

Never use strong detergents or solvents such as alcohol or thinners to clean the projector and lens.

Notes

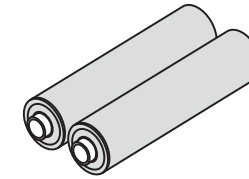
What's in the box?



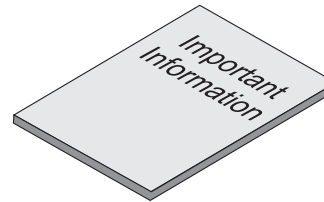
Projector



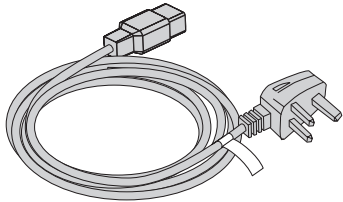
Remote Control



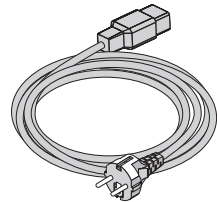
Batteries (2xAAA)



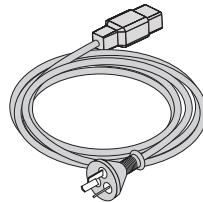
Important Information Book



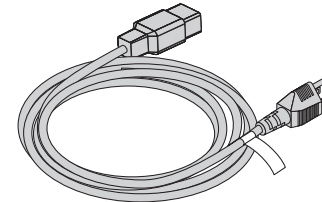
Power Cable, UK



Power Cable, Europe



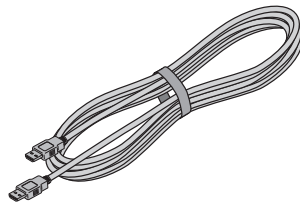
Power Cable, China



NEMA 5-15P - C13 Power Cable, North America







3 Pin to BNC Adapter Cable



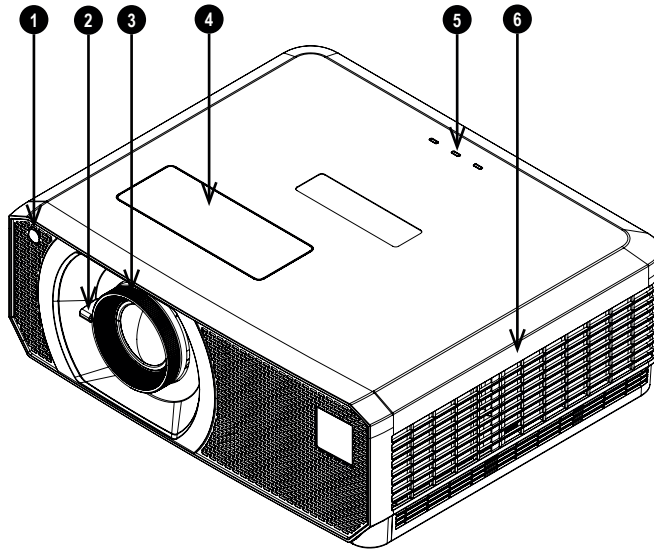
HDMI Cable

Notes

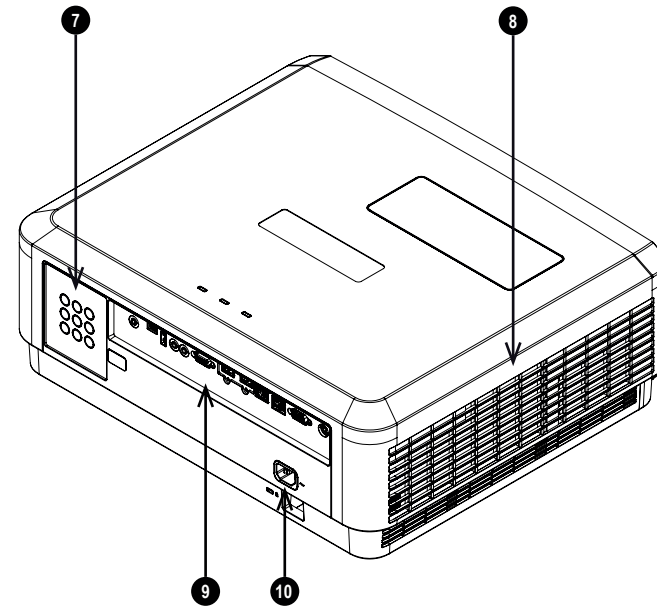
-  *Make sure your box contains everything listed. If any pieces are missing, contact your dealer.*
-  *Only one remote is supplied with the projector.*
-  *Save and store the original box and packing materials, in case you ever need to ship your projector.*
-  *Only the appropriate cable for destination territory is supplied with the projector*

Projector overview

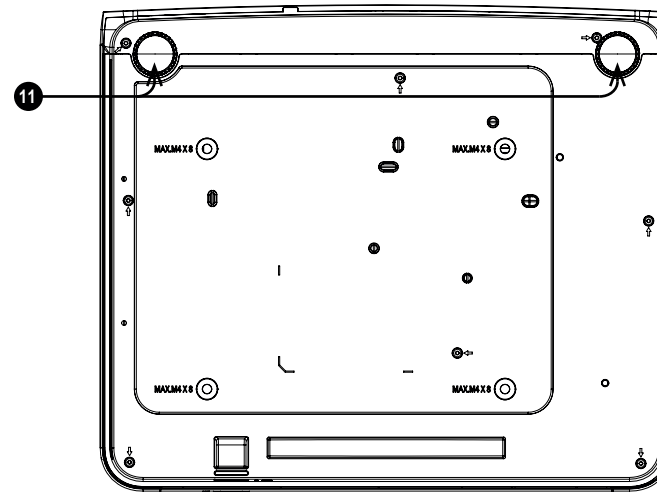
1. Front infrared window
2. Zoom control
3. Focus control
4. Lens shift controls
5. Indicators
6. Air outlet
7. Control panel
8. Air inlet
9. Connections panel
10. Mains socket
11. Adjustable feet



Front View




Rear View



Bottom View

Notes

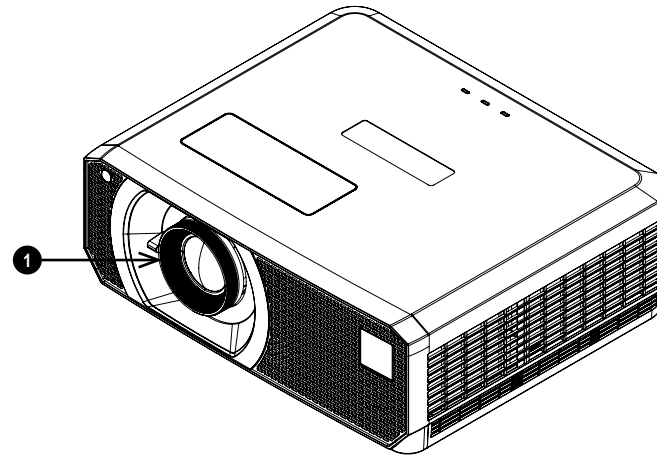
 See Product labels on page 62 for details about the labels that are located on the projector.

Location of Laser Aperture

1. The laser aperture is located as indicated below.



Do not look directly at the light coming from the lens.

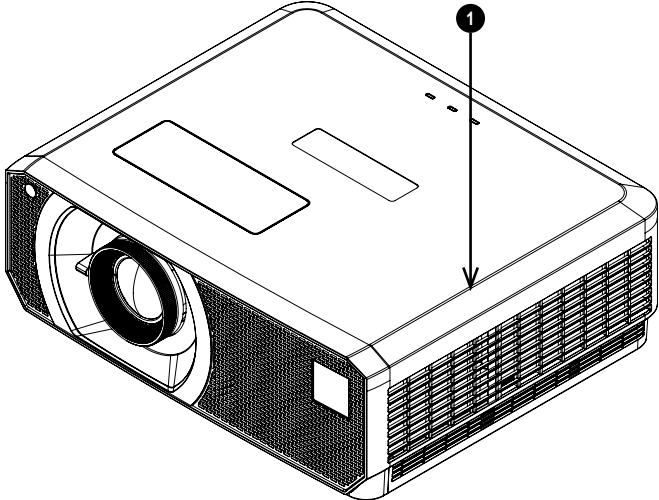


Notes

Interlock Switches

Interlock switches are installed inside the projector. These will power-off the system when activated.

- 1. Will be activated when the top cover is removed.



Notes

Installation Precautions

Notes



The projector must be installed only by suitably qualified personnel, in accordance with local building codes.

The projector is heavy. Use safe handling techniques when lifting the projector.

Do not drop or knock the projector.

Do not install the projector close to anything that might be affected by its operational heat, for instance, polystyrene ceiling tiles, curtains etc. Place the projector in a dry area away from sources of dust, moisture, steam, smoke, sunlight or heat.

Ensure that the intake vents do not recycle hot air from the exhaust vent.

When operating the projector in an enclosed space, ensure that the surrounding air temperature within the enclosure does not exceed operation temperature while the projector is running, and the air intake and exhaust vents are unobstructed.

All enclosures should pass a certified thermal evaluation to ensure that the projector does not recycle exhaust air, as this may cause the device to shutdown even if the enclosure temperature is within the acceptable operation temperature range.

Avoid installing at high temperature, insufficient cooling and heavy dust locations.

Keep your product away from fluorescent lamps (>1 Meter) to avoid malfunction caused by IR interference.

Avoid installing near an air conditioner duct or a subwoofer.

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.

Please pay attention to projector installation with respect to other staging laser light equipment set-up. These systems can cause permanent damage to the DMD imaging devices used in our projectors. This damage is not covered by our warranty.

When using projectors in environments with third party high power laser systems avoid direct laser beams pointing towards the projection lens. This may cause incident light to converge into the optical engine and cause damage to the DLP DMD.

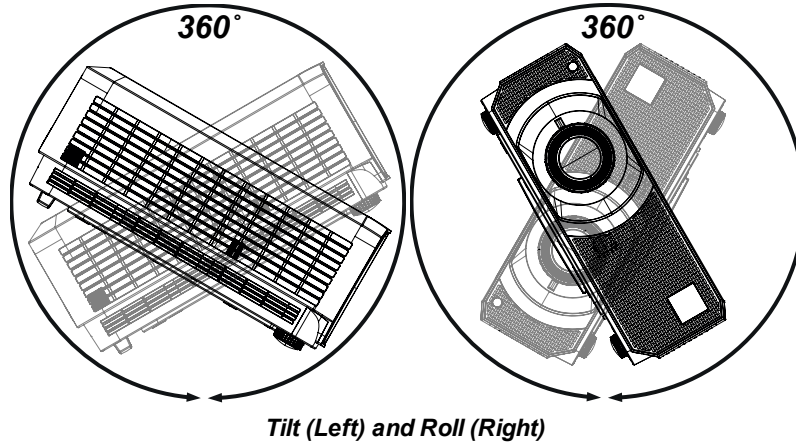


Before installation, make sure that the surface, ceiling or rigging that is to support the projector is capable of supporting the combined weight of the projector and lens.

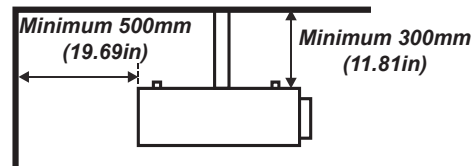
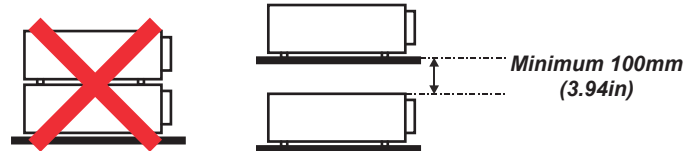
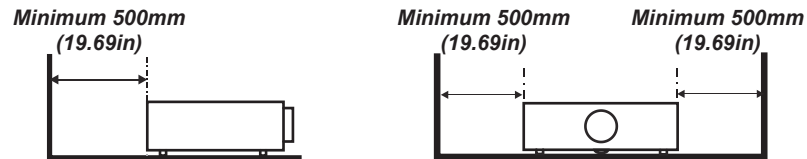
Backup safety chains or wires should always be used with ceiling mount installations.

When installing a ceiling mount, make sure the weight limit is not exceeded and the projector is firmly secured.

The projector can be operated any position, as shown in the diagram:



Allow at least 50cm (19.7in) of space between the ventilation outlets and any wall, and 30cm (11.8in) on all other sides.



Example Positioning

Notes



Make sure the lens cap is removed from the lens before operating the projector. Light energy levels have been known to cause damage to both the lens and projector optics. This damage is not covered by our warranty.

Connect the LAN cable only to a computer LAN connection. Other similar connectors may have a dangerously high voltage source.

A VGA IN connector should be used to connect to the VGA IN port on the projector. It should be inserted tightly, with the screws on both sides securely fastened to ensure proper connection of the signal wire for achieving optimal display effect.

An AUDIO IN connector should be used to connect to the AUDIO IN port on the projector.

The power cord and signal cable should be connected before the projector is powered on. During startup and operation, DO NOT insert or remove the signal cable or the power cord to avoid damaging the projector.




The projector generates heat during use. The internal fans dissipate the heat of the projector when shutting down, which could continue for a certain period. After the projector enters STANDBY MODE, remove the power cord. DO NOT remove the power cord during shutdown as it may cause damage to the projector and may affect the service life of the projector.

Do not place heavy objects on top of the projector chassis.

Notes

Laser Safety Precautions

 **Warning! Death or Serious Injury could occur if the following precautions are ignored**

 **Permanent/Temporary Blindness Hazard**

 **Class 1 RG2 Laser Product. Caution! Do not stare into beam. Class 1 IEC 60825-1:2014, RG2 IEC 62471-5:2015.**


The product should be installed and operated in accordance with the provisions of IEC 62471-5:2015 and the Important Information document or User Manual

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

Do not attempt to operate the product without covers in place.

Do not look directly into the lens when the light source is on. The high brightness can cause permanent eye damage.

Notes

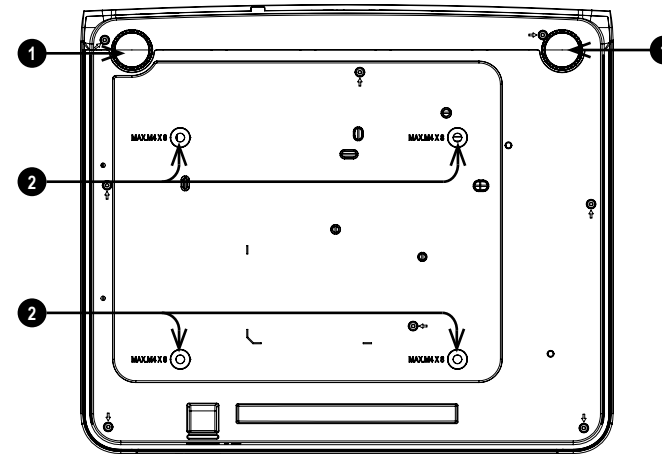
 See Product labels on page 62 for details about the labels that are located on the projector.

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

1. **Two adjustable feet ①.**
2. **Four M4 holes for ceiling mount ②.**
The screws should not penetrate more than 8 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 (19.7 in) of space between the ventilation outlets and any wall, and 30 cm (11.8 in) on all other sides.



Do not use the threaded holes for the adjustable feet to hang or mount the projector.



Avoid extending the adjustable feet to the limit of the thread.

Power Supply

AC Power Precautions



Warning! Death or Serious Injury could occur if the following precautions are ignored

Shock Hazard! Only use the AC power cord provided or recommended by the manufacturer

Fire & Shock Hazard! Do not operate the product unless the power cord, socket and plug meet local rating standards

Do not attempt operation if the AC supply is not within the specified parameters

The AC power cord must be inserted into a socket with grounding

Disconnect the product from the AC supply before installing, moving, servicing, cleaning or removing covers

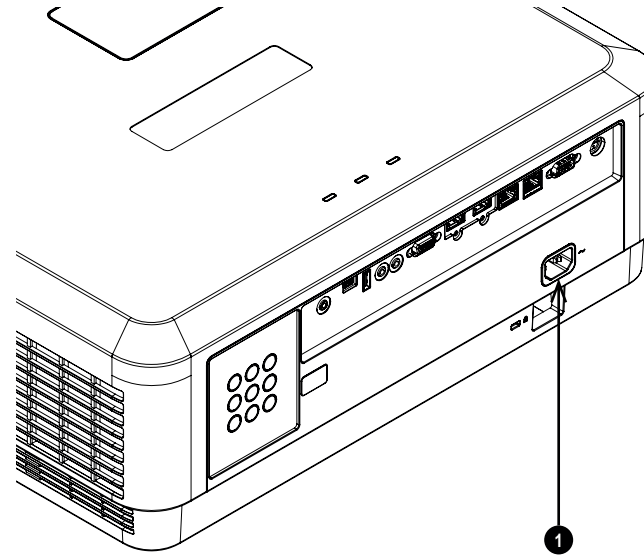
Do not use an AC power cord that appears damaged

Do not overload power sockets or extension cords

Notes

Connecting the power supply

1. Firmly push the mains connector into the AC In socket ①



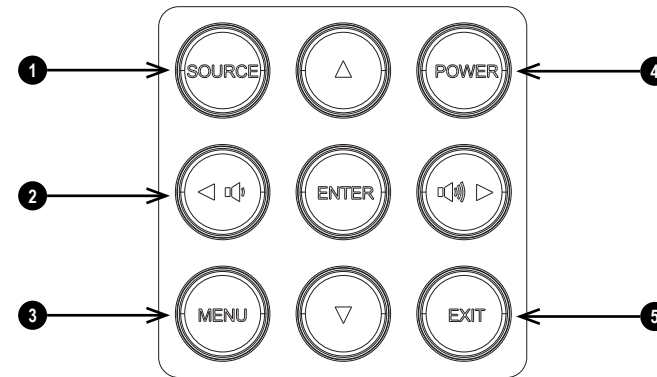
Notes

- ⚡ 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.

Operating the projector





Control panel

1. **SOURCE**
Displays and exits the source menu
2. **Arrow buttons & ENTER**
Press the left or right arrow button to open the volume menu. Use the left or right arrow buttons to adjust the audio volume. After opening the OSD, use the arrow buttons to highlight menu entries. Press **ENTER** to open or execute the highlighted menu entry.
3. **MENU**
Displays and exits the OSD.
4. **POWER**
Switches the projector on and off (STANDBY).
5. **EXIT**
Exits the current OSD page and enters the level above. Exits the OSD when at the top level OSD page.



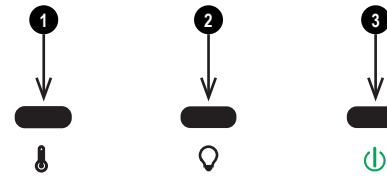
Control Panel

Notes

-  The first time you use the projector, you can set OSD language from the quick menu. (See Setting the OSD language in the user manual.)
-  See Connecting the power supply on the previous page.
-  The direct power on feature can be enabled in the Settings menu. See Settings on page 54.
-  See Using the menus on page 42 for full details of how to use the controls and the menu system.

Projector indicators

1. **TEMP.**
On, red = error (**LIGHT** indicator will also blink, the number of blinks indicates which temperature sensor is in error. Please contact your local authorized Digital Projection service center for further assistance)
2. **LIGHT**
On, green = light is on and stable
3. **POWER**
On, blue = projector is switched on
Flashing blue = system power on, or system cooling down
On, amber = standby mode



Indicators

Notes

Remote control

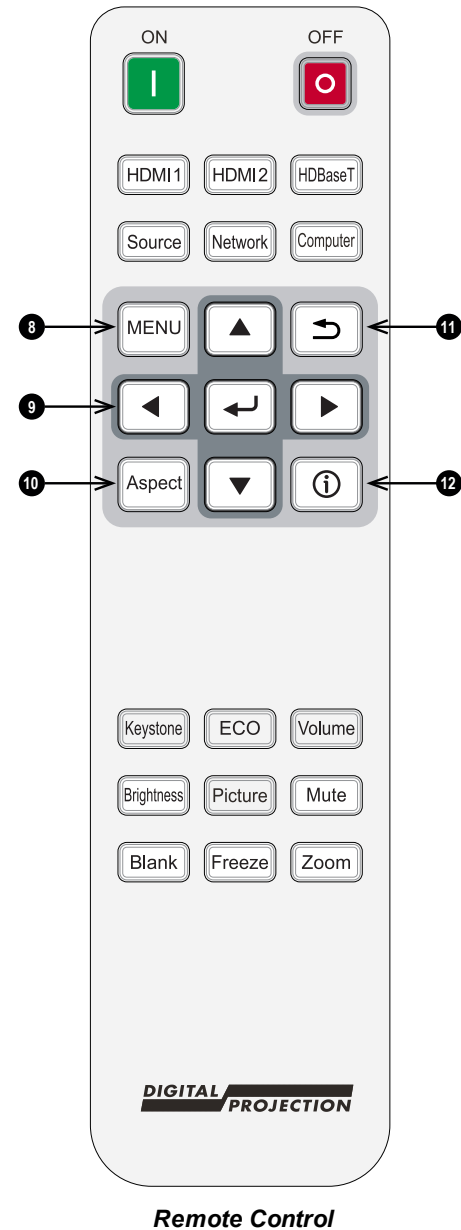
1. **Power ON / OFF**
Turns power on and off.
2. **HDMI 2**
Select the HDMI 2 input.
3. **HDMI 1**
Select the HDMI 1 input.
4. **Source**
Open the Source menu in the OSD.
5. **HDBaseT**
Select the HDBaseT input.
6. **Computer**
Select the Computer In input.
7. **Network**
Open the Network menu in the OSD.



Remote Control

Notes

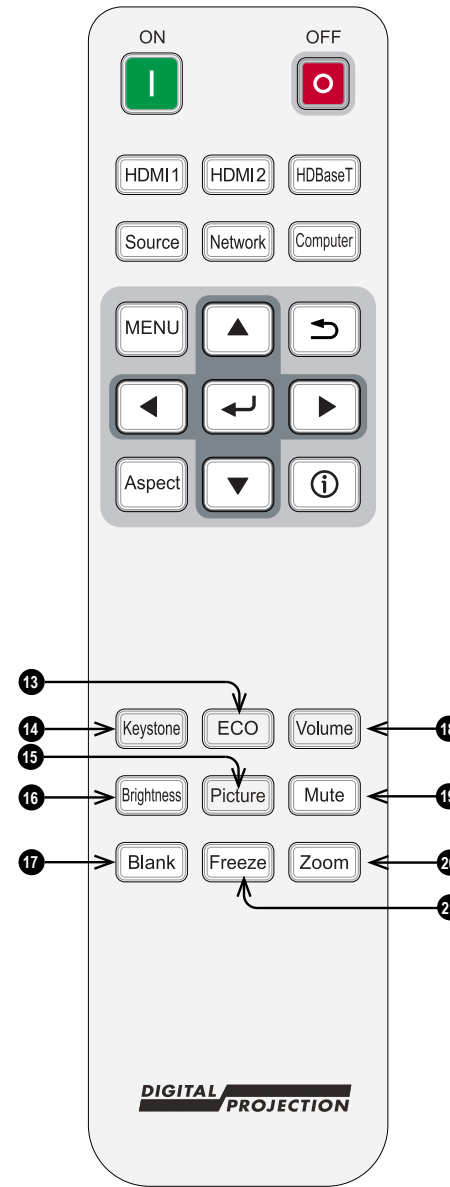
8. **MENU**
Access the OSD. If the OSD is open, press this button to close.
9. **Navigation (arrows and return)**
When the OSD is active, navigate through the menus with the arrows, confirm your choice with the return button.
10. **Aspect**
Open the Aspect Ratio menu in the OSD.
11. **Back**
When the OSD is active and a sub-menu is displayed, press to return to the previous menu level.
12. **Information**
Open the info menu in the OSD.



Remote Control

Notes

- 13. **ECO**
Open the Standby Power menu in the OSD.
- 14. **Keystone**
Open the V Keystone menu in the OSD.
- 15. **Picture**
Open the Picture Mode menu in the OSD.
- 16. **Brightness**
Open the Brightness menu in the OSD.
- 17. **Blank**
Shows and hides the projected image.
When blanking is enabled, the light source is completely switched off and the screen is blank.
- 18. **Volume**
Open the Volume slider. Use the left and right navigation arrows to adjust the volume.
- 19. **Mute**
Mutes the audio.
- 20. **Zoom**
Open the Digital Zoom menu in the OSD.
- 21. **Freeze**
Freeze the current frame.



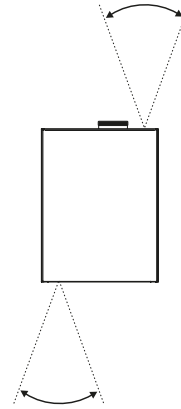
DIGITAL PROJECTION

Remote Control

Notes

Infrared reception

The projector has infrared sensors at the front and rear.



Switching the projector on

1. Connect the power cable between the mains supply and the projector.
The **POWER** indicator lights orange to indicate that the projector is in STANDBY mode.
2. Press one of the following buttons:
 - On the remote control, the **ON** button
 - On the projector control panel, the **POWER** button.

The **POWER** indicator begins flashing blue. In approximately 35 seconds, the active input appears. The **POWER** indicator is now lit blue and the **LAMP** indicator is now lit green. The projector is now 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 light source will go out. The **POWER** indicator will start flash blue for 5 seconds. The **POWER** indicator stops flashing blue and changes to solid orange when the projector enters Standby mode.
2. If you need to switch the projector off completely, wait until the projector enters Standby mode, then disconnect the AC power cable from the projector.

Notes

Interlock reset

In the event of the laser illumination turning off as a result of an Interlock break:

1. Make sure all interlocks are in place. See Interlock Switches on page 15
2. Turn ON the laser illumination. See Switching the projector on on the previous page

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.
 - Press **SOURCE** on the remote control or control panel. Use the **UP** and **DOWN** navigation buttons to select the input source in the **SOURCE** menu. Press **ENTER** to confirm your choice.

Selecting a test pattern

This projector is able to display a grid test pattern.

Use one of the following methods to display a test pattern:

1. Press **MENU** on the remote or control panel to open the OSD.
2. Use the **LEFT** and **RIGHT** arrow buttons to access the **Input** menu.
3. Use the **UP**, **DOWN** and **RETURN** buttons to access the **Test Pattern** sub menu.
4. Use the **LEFT** and **RIGHT** arrow buttons to select the Grid test pattern.

To return to the main image, set the test pattern to Off and press **MENU** to exit the OSD.

Notes

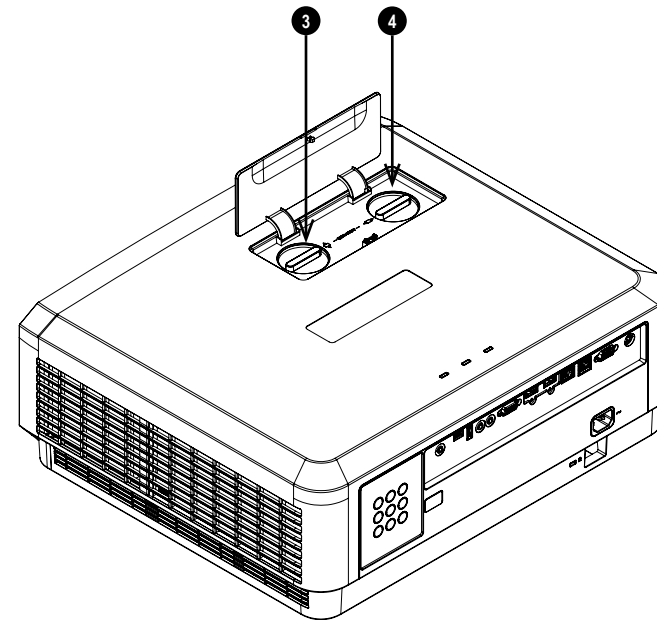
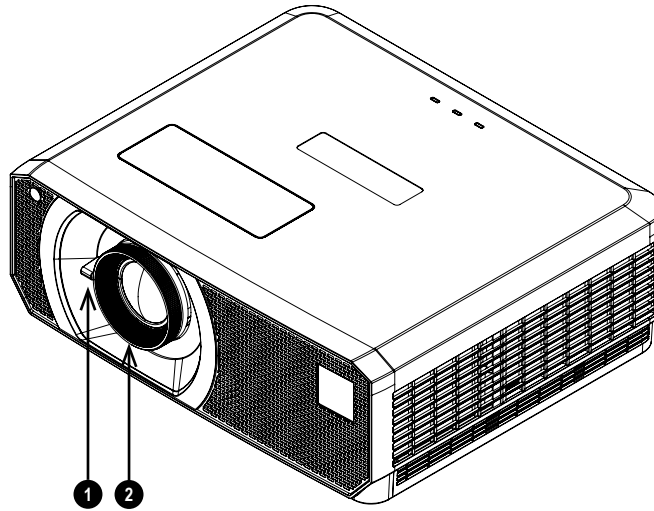


Please refer to the connection guide for details about connecting a signal source. See Signal inputs on page 34

Adjusting the lens

The lens can be adjusted using the controls on the lens and the controls on the body of the projector:

- Use the zoom control **1** on the lens to zoom in or out.
- Use the horizontal shift control **4** and the vertical shift control **3** on the body of the projector to adjust the position of the image on the screen.
- Use the focus control **2** on the lens to focus the image.



Notes

Adjusting the image

Orientation

This can be set from the **Alignment** menu. See Alignment on page 51 for guidance.

Highlight **Projection** and choose from **Front**, **Rear**, **Front + Ceiling** and **Rear + Ceiling**.

Geometry

Settings such as **Vertical Keystone** can be set from the **Alignment** menu. See Alignment on page 51 for guidance.

Picture

Settings such as **Picture Modes**, **Color Manager**, **Contrast**, **Brightness**, **Sharpness**, advanced settings and other picture enhancements can be set from the **Picture** menu. See Picture on page 49 for guidance.



This product includes a DICOM simulation feature intended for training and other non-medical diagnosis purposes.

Adjusting the audio

The audio output can be adjusted using the remote control or OSD:

- Use the **Volume** button on the remote to open the volume bar. Use the LEFT and RIGHT arrow buttons to adjust the volume level.
- Use the **Mute** button on the remote to mute the audio.
- Press **MENU** on the remote or control panel to open the OSD. Navigate to the **PICTURE** menu and open the **Audio** sub menu to adjust the audio volume.

Notes

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A Delta Associate Company

E-Vision 4000 Series

High Brightness Digital Video Projector

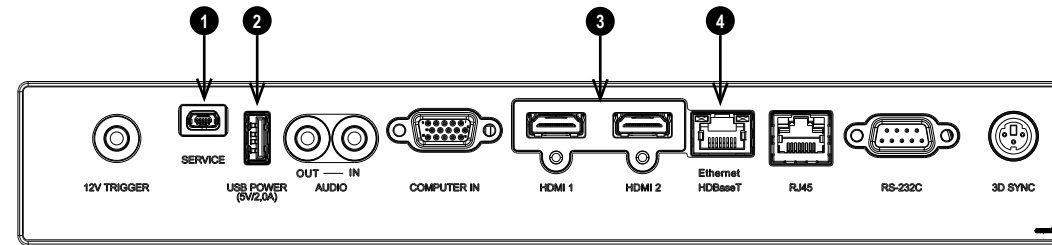
CONNECTION GUIDE

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Signal inputs

Digital inputs and outputs

1. **Service**
This port is for servicing purposes only.
2. **USB**
USB 5V / 2A output. Connect a USB cable to supply power to an external device.
3. **HDMI 1 / HDMI 2**
HDMI input. Connect an **HDMI** cable to the connector.
4. **Ethernet/HDBaseT**
Receives digital signal from HDBaseT-compliant devices. Connect an HDBaseT 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.

See 2D formats on page 68 for information about supported 2D signal input modes.

See 3D connections on page 37 for information about 3D signal inputs.

EDID on the HDMI, and HDBaseT 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 capability of the projector.

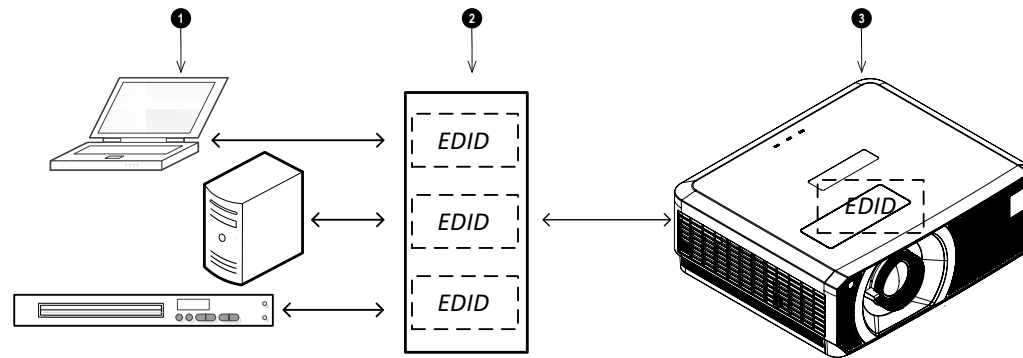
Otherwise refer to the documentation supplied with the source to manually set the resolution to the DMD™ resolution of the projector or the nearest suitable setting. Switch off the source, connect to the projector, then switch the source back on again.

Using HDMI / HDBaseT switchers with the projector

When using a HDMI/HDBaseT 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.

1. Sources
2. Switcher
3. Projector



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

Notes

Analog inputs and outputs

1. Audio In/Out

Use the Audio In (3.5 mm stereo jack socket) to input audio.

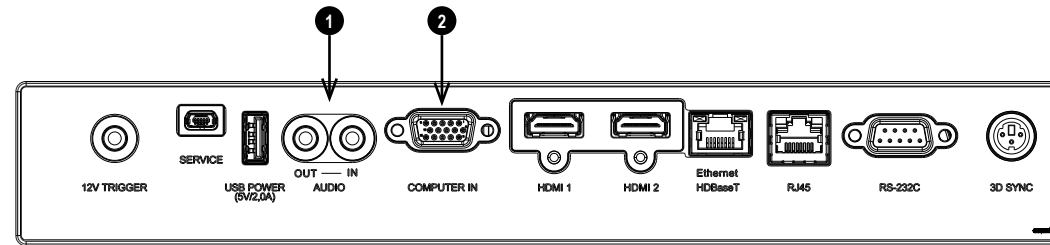
Use the Audio Out (3.5 mm stereo jack socket) to output audio.

2. Computer In

This input receives analog signals from a computer.

When using this input, it is best to use a fully wired VGA cable to connect the source to the projector.

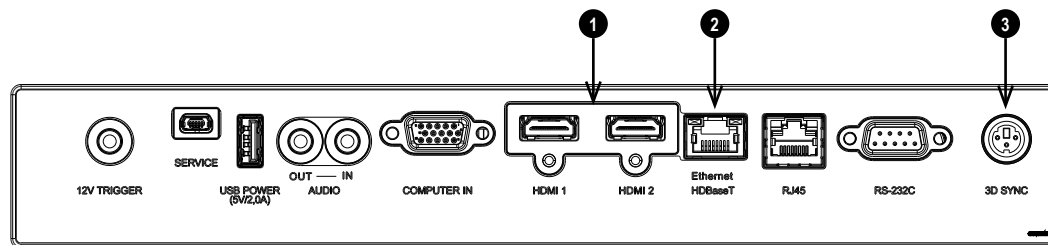
This will allow the source to determine the projector's capabilities via DDC and show an optimized image. Such cables can be identified as they have a blue connector shell.



Notes

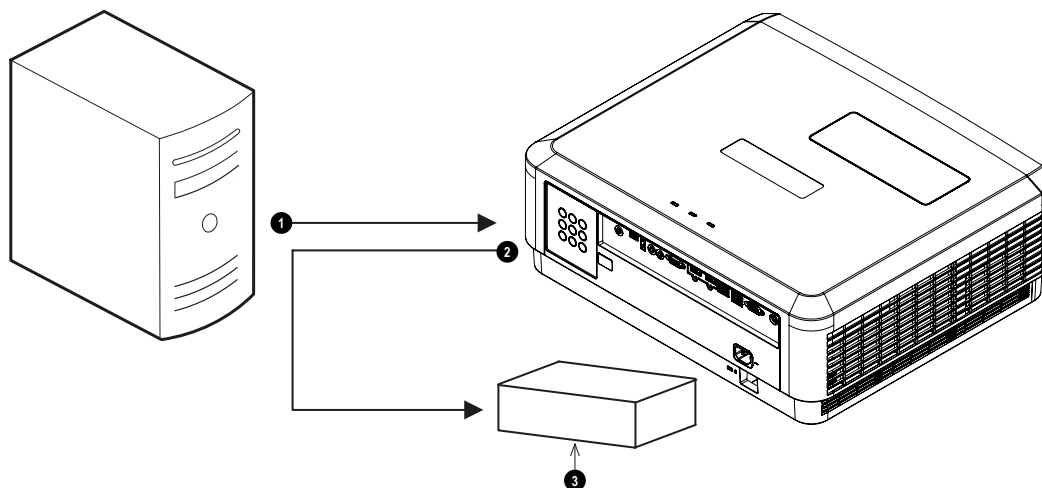
3D connections

1. **HDMI 1 / HDMI 2**
HDMI inputs supporting **Top and Bottom, Side By Side** and **Frame packing** 3D formats. Connect an **HDMI** cable to the connector.
2. **HDBaseT**
Receives 3D signal from HDBaseT-compliant devices. Connect an HDBaseT cable.
3. **3D Sync**
Sync output signal. Connect this to an IR emitter.





3D Sync


1. 3D Input
2. 3D Sync Out
3. IR emitter



Notes

 Set the **3D** type in the **3D** menu to match the format of the incoming signal. See **3D** on page 48.

 See **3D** formats on page 70 for information about supported **3D** signal input modes.

 See **3D** formats on page 70 for information about supported **3D** sync formats.

Control connections

1. 12V Trigger

The trigger output can be used to control an electrically operated screen. The screen will be automatically deployed when the projector starts up and retracted when the projector shuts down.

2. Ethernet/HDBaseT

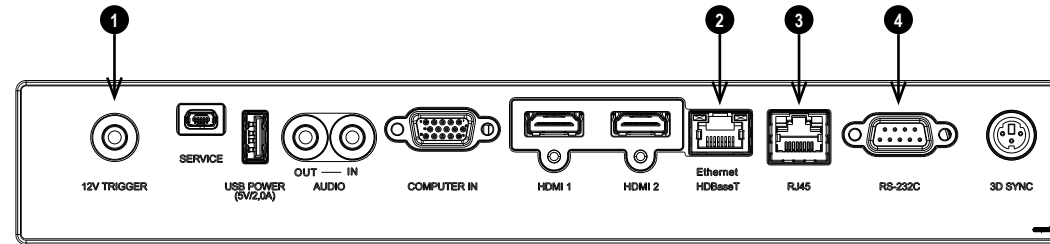
The projector's features can be controlled via a HDBase-T or LAN connection, using a terminal-emulation program.

3. RJ45


This dedicated LAN connection can be used if **Ethernet/HDBaseT** is already being used for HDBaseT signal input.


4. RS232


All of the projector's features can be controlled via a serial connection, using commands described in the **Protocol Guide**. Use a crossover cable to connect directly to a computer.



Notes

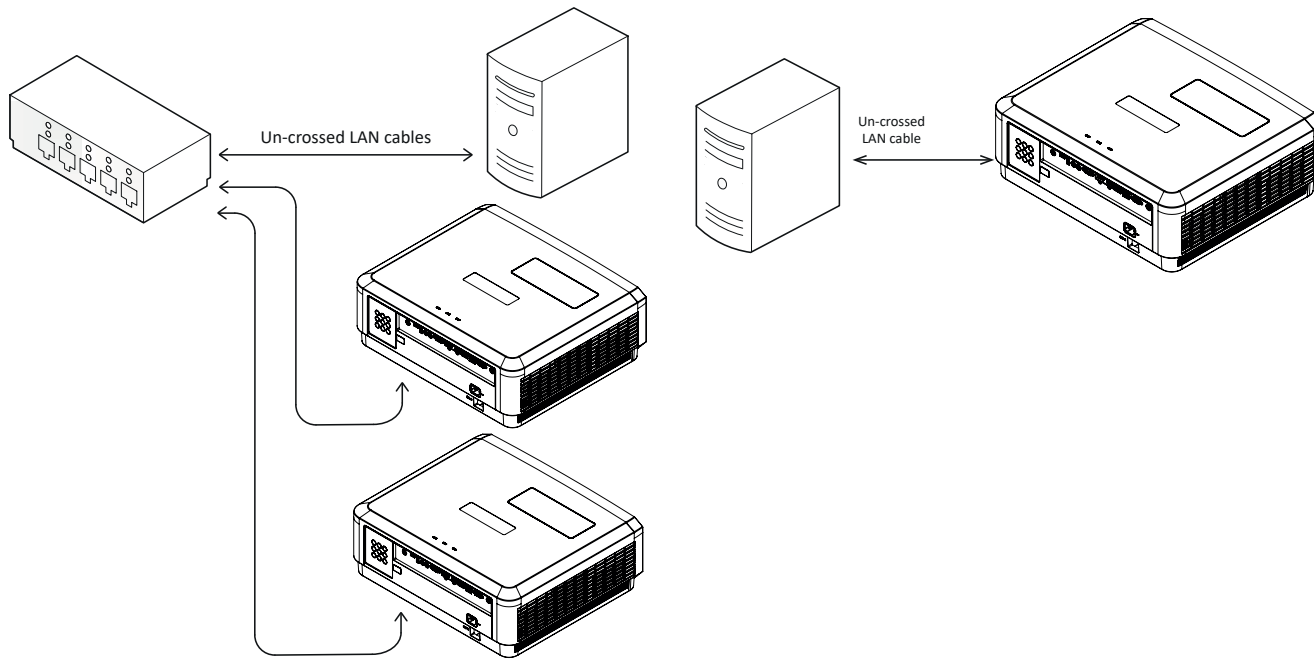
 For a list of all commands used to control the projector via LAN, see the **Protocol Guide** (available separately).

 Only one control connection should be used at any one time.


 With a LAN connection the projector can serve a web page offering status and projector controls.


LAN connection examples

The projector's features can be controlled via a LAN connection, using a terminal emulation program.



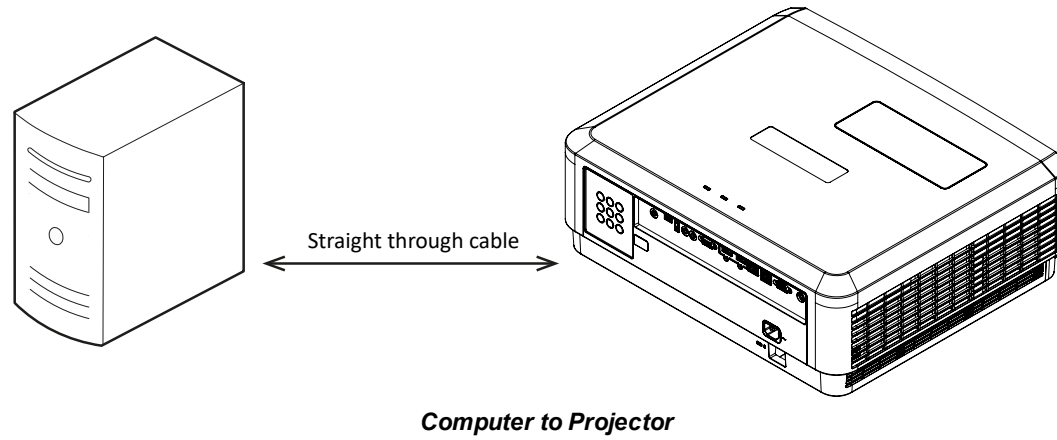
Notes

 With a LAN connection the projector can serve a web page offering basic projector controls.


 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.

RS232 connection example

All of the projector's features can be controlled via a serial connection, using commands described in the **Protocol Guide**.



Notes

 The **Protocol Guide** is available separately



A Delta Associate Company

E-Vision 4000 Series

High Brightness Digital Video Projector

OPERATING GUIDE

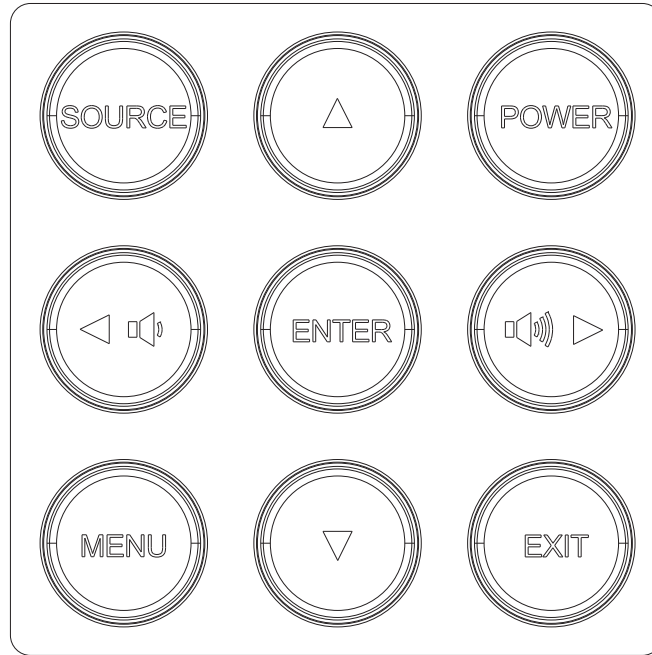
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Using the menus

Opening the Menu

Use the projector control panel or the remote control to open the on-screen display (OSD). On either device:

1. Press the **MENU** button.
The OSD opens showing the list of available menus



Projector control panel



Remote control

Notes

Exiting menus and closing the OSD

To go back to the previous page:

1. Press **EXIT**.

To close the OSD:

1. Press **MENU**.

Or:

1. Go back to the top level menu
2. Press **EXIT**.



On Screen Display (OSD): Top Level Menu

Notes

Inside the Menu

When you open the OSD, a menu is displayed. There are five main menus:

- Input
- Picture
- Alignment
- Settings
- Info

Each menu is displayed at the top of the OSD. Available menus are highlighted in blue. The menu you are currently viewing is highlighted in gray.

The contents of each menu consists of the following elements:

- The path to the current menu. This is displayed when you are accessing a submenu.
- 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 (a return/right arrow button is displayed)

The bottom of the OSD shows instructions for navigating the OSD. The instructions are highlighted in blue and change for each menu and submenu.

Opening a submenu

Move up and down the list using the **UP** and **DOWN** arrow buttons.

To open a submenu:

1. Press **ENTER** on the control panel or remote control.

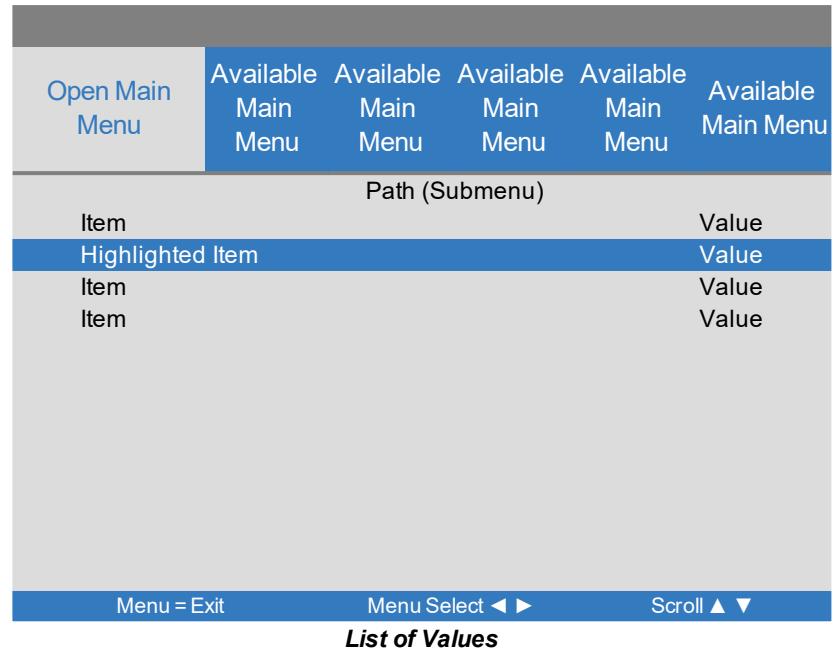


Notes


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. Press the **UP** and **DOWN** arrow buttons to highlight the menu item.
2. Press the **LEFT** and **RIGHT** arrow buttons to change the value.



Notes

 Some menu items may be unavailable due to settings in other menus. Unavailable menu items appear gray.

 Please wait for any value changes to be applied.

Editing numeric values

Some parameters use numeric values - for example 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** to enter edit mode
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 **BACK** to exit edit mode.

Menu	Menu	Menu	Menu	Menu	Menu
Item					25
Highlighted Item					50
Item					100
Item				255.255.255.255	

Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼

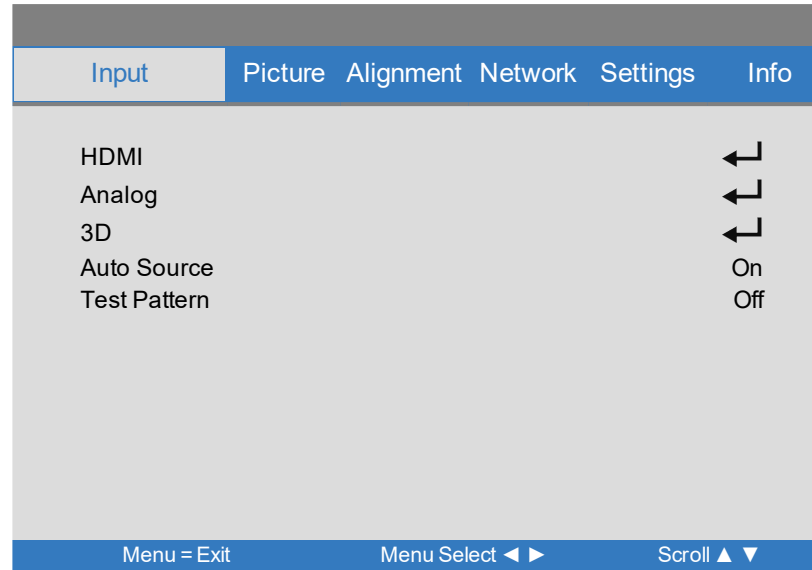
List of Values

Notes

Using the projector

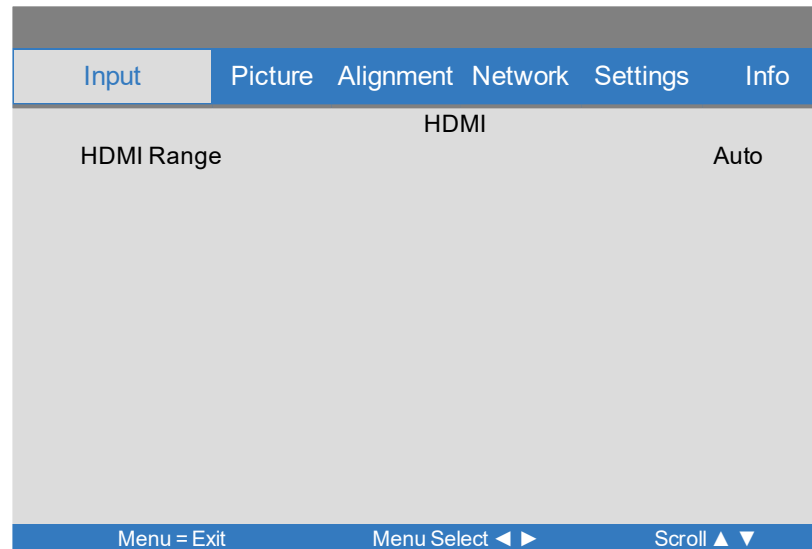
Input

- HDMI, Analog, 3D
Access the submenu to edit the settings.
- Auto Source
Activate this option to automatically cycle to the first active signal input.
- Test Pattern
Select a test pattern to display. Choose from: *Off* and *Grid*



HDMI

- HDMI Range
Choose from Auto, Full and Limited.



Notes

Analog

- Horizontal Position, Vertical Position
Adjusts the horizontal and vertical display position.
- Phase
Adjusts the phase of the pixel sampling clock relative to the incoming signal. Adjust the phase if noise is visible.
- Clock
Adjusts the frequency of the pixel sampling clock. Flicker or vertical banding indicate poor tracking.





Input	Picture	Alignment	Network	Settings	Info
Analog					
H Position					0
V Position					0
Phase					46
Clock					0
Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼					

3D

- 3D
Choose **DLP-Link** when using 3D shutter glasses. Choose **IR** when using infrared 3D glasses.
- 3D Sync Invert
Choose **On** to swap the left- and right-eye images, if they are displayed in the wrong order.

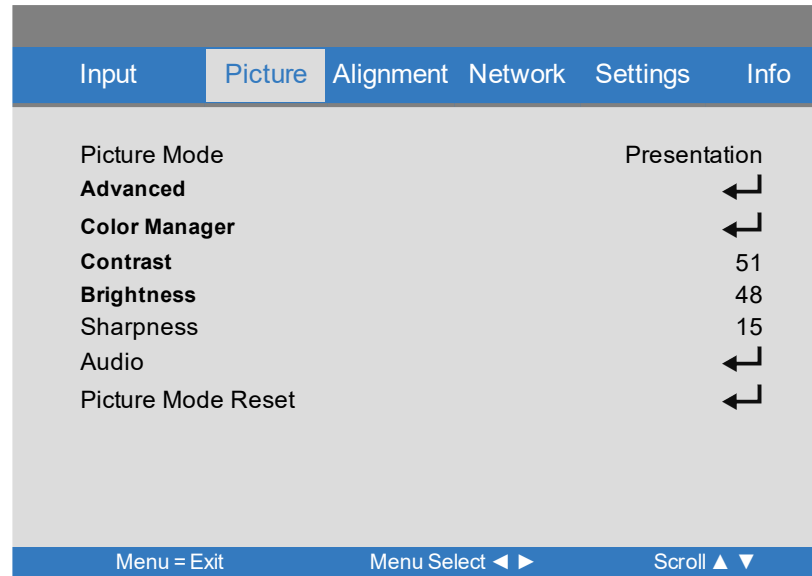
Input	Picture	Alignment	Network	Settings	Info
3D					
3D				DLP-Link	
3D Sync Invert				Off	
Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼					

Notes


-  You must connect an Infrared emitter when using 3D IR (utilizing Active 3D Glasses), alternatively a ZScreen system (utilizing Passive Polarized 3D glasses) can be used.
-  If 3D is set to **Off**, all other 3D settings will be unavailable.
-  See 3D connections on page 37 for more information about supported 3D formats.
-  See 3D formats on page 70 for 3D resolutions and frame rates.


Picture

- **Picture Mode**
Choose from **Bright, Presentation, Game, Movie, sRGB, DICOM, and User**.
Use a different setting depending the type of input source.
- **Advanced, Color Manager**
Access the submenu to edit the settings.
- **Brightness, Contrast, Sharpness, Audio**
Adjust the levels as required.
- **Picture Mode Reset**
Resets the picture settings to default values



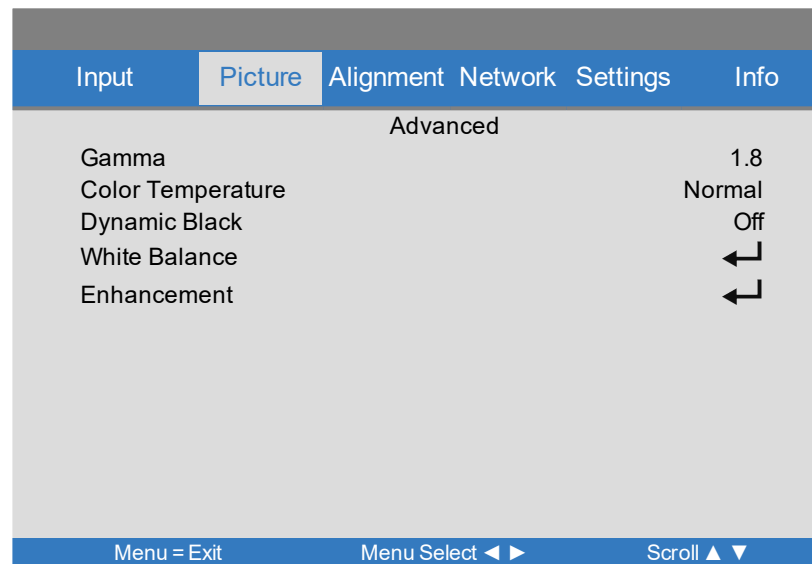
Notes

 *HDR picture mode is automatically selected when the projector detects an input with a HDR10 signal format.*

 *The visible image may blank for a short period when cycling through the Picture Modes.*

Advanced

- **Gamma**
Choose a de-gamma curve from **1.8, 2.0, 2.2, 2.4, B&W, Linear**
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.
- **Color Temperature**
Choose from **Warm, Normal, Cold**
- **Dynamic Black**
Set to On to allow for increased contrast in darker scenes by modulating the light source.
- **White Balance, Enhancement**
Access the submenu to edit the settings.



White Balance

- R Gain, G Gain, B Gain
Adjust the bright part of the scale for red, green and blue colors.
- R Offset, G Offset, B Offset
Adjust the black levels for red, green and blue colors.

Input	Picture	Alignment	Network	Settings	Info
White Balance					
R Gain					100
G Gain					100
B Gain					100
R Offset					0
G Offset					0
B Offset					0
Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼					

Enhancement

- Brilliant Color
Adjusts the brightness and hue of secondary colors. Set the level as required.
- MEMC
Adjusts the smoothness of 24 fps video to reduce motion blur. Choose from **Off**, **Low**, **Medium** or **High**.
- Image Peaking
Motion adaptive sharpness enhancement. Set the level as required.

Input	Picture	Alignment	Network	Settings	Info
Enhancement					
Brilliant Color					0
MEMC					Off
Image Peaking					0
Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼					

Notes

Color Manager

- Color
Select a color to adjust, Choose from:
 - **Red, Green, Blue, Yellow, Magenta, Cyan**
Adjust **Hue**, **Saturation** and **Gain** settings for each individual color to improve the color balance of the projected image.
 - **White**
Adjust **Red**, **Green** and **Blue** settings for the white color to improve the color balance of white in the projected image.

Input	Picture	Alignment	Network	Settings	Info
Color Manager					
Color					Red
Hue					50
Saturation					53
Gain					58
Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼					

Alignment

- Aspect Ratio
Set the aspect ratio for the projected image. Choose from **Fill**, **4:3**, **16:9**, **Letter Box**.
- Digital Zoom
Adjust to zoom into or out from the center of the image.
- V Keystone
Use this setting to compensate for any distortion caused by the projector being in a different vertical plane to the screen.
- Projection
Choose from **Front**, **Rear**, **Front + Ceiling** and **Rear + Ceiling**.

Input	Picture	Alignment	Network	Settings	Info
Aspect Ratio					16:9
Digital Zoom					0
V Keystone					0
Projection					Front
Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼					

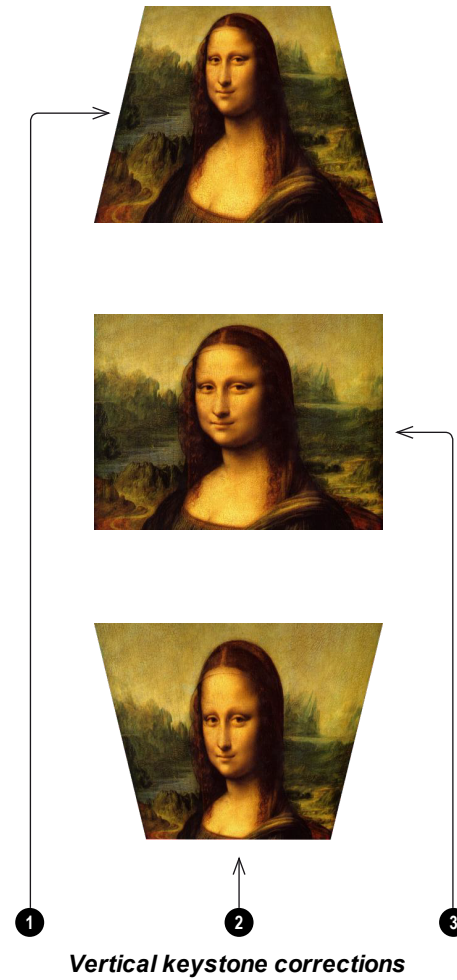
Notes



Keystone correction will reduce the resolution of the original image.

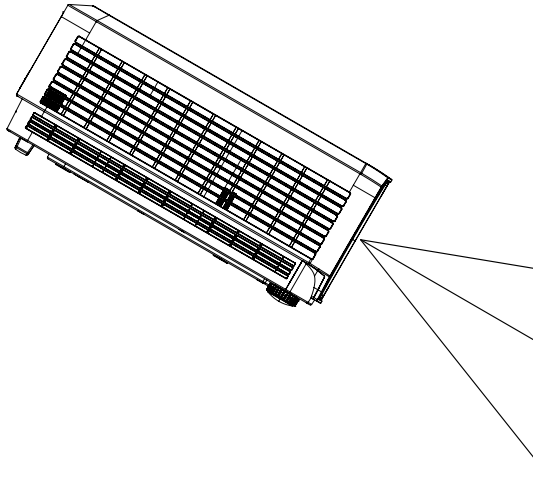
Keystone settings

1. **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.
2. **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.
3. **Projector straight** The projector is directly opposite the screen at a right angle both horizontally and vertically. No correction is needed.

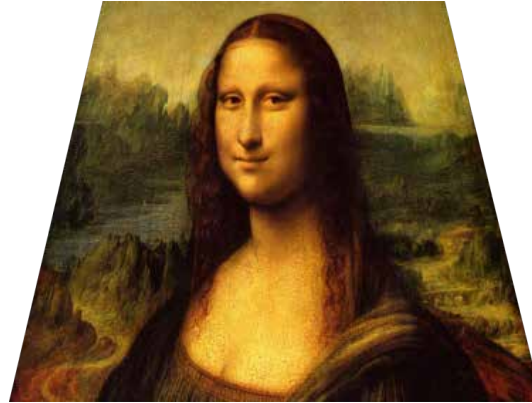
**Notes**

Keystone example

The projector is positioned at an angle



The resulting image is distorted



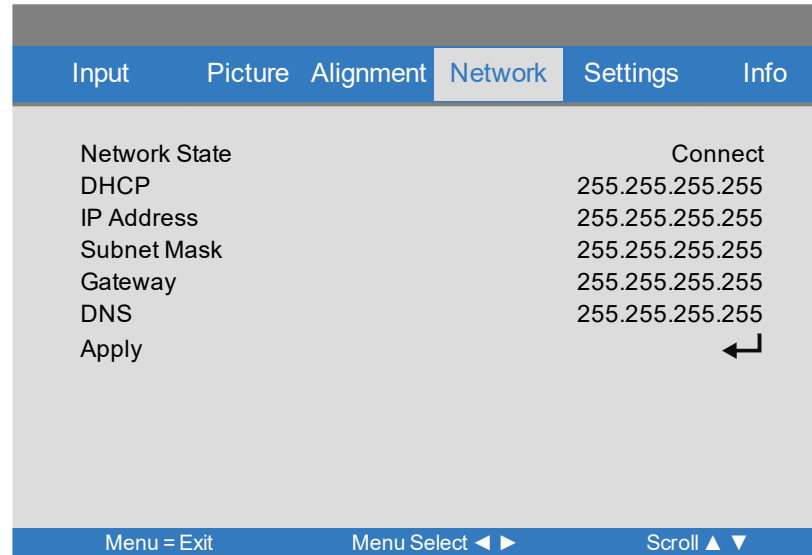
The image is corrected when Keystone is applied



Notes

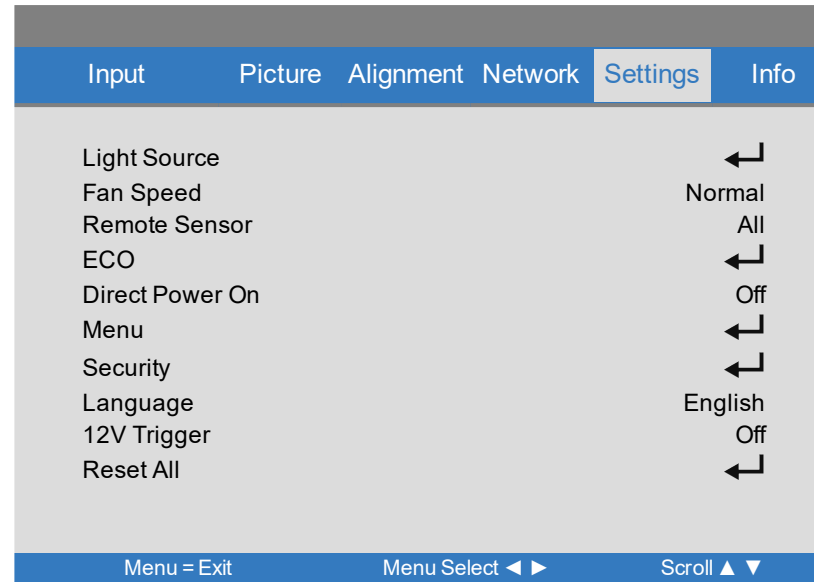
Network

- Network State
Displays the current network status.
- DHCP, IP Address, 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.
- Apply
Select to apply any changes to the network setup.



Settings

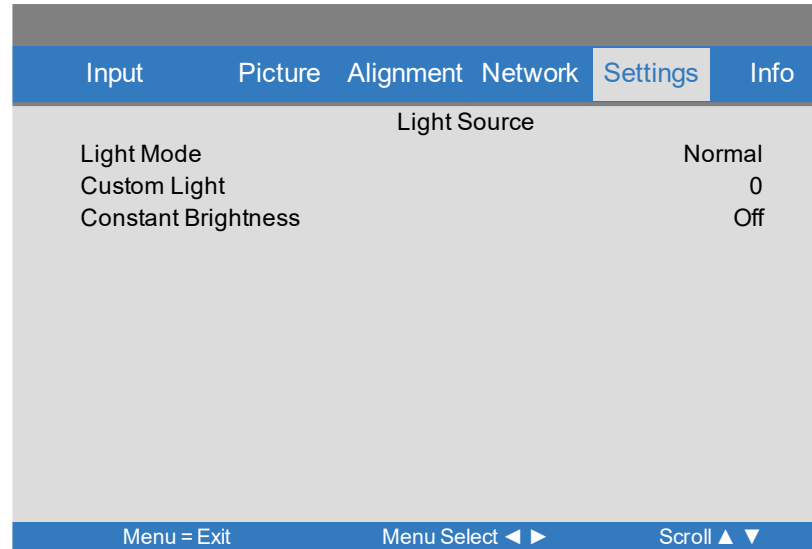
- **Light Source**
Access the submenu to edit the settings.
- **Fan Speed**
Choose from **Normal** or **High**.
- **Remote Sensor**
Use this setting to activate the remote control sensors on the body of the projector. Choose from **All**, **Front**, **Rear**.
- **ECO**
Access the submenu to edit the settings.
- **Direct Power On**
Set to **On** to automatically power the projector on when the power cable is inserted. When set to **Off**, use the power button on the control panel or the on and off buttons on the remote to switch the projector on or off.
- **Menu, Security**
Access the submenu to edit the settings.
- **Language**
Choose a language for the OSD.
- **12V Trigger**
Set to **On** to activate the 12V trigger input on the connection panel.
- **Reset All**
Select reset all settings to the factory defaults.



Notes

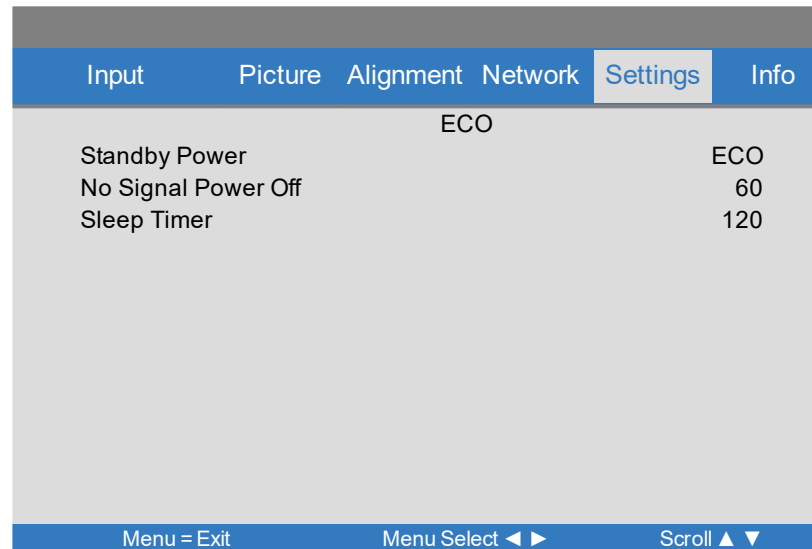
Light Source

- Light Mode
 - **Normal** will set the power to 100%.
 - **Eco** will automatically set the laser power to 80%.
- Custom Light
Choose a value between 30 and 100, ranging from 30% to 100% laser power.
- Constant Brightness
Set to **On** to initially limit the brightness to 75% of maximum light output. Light output is then increased in 5% stages until the maximum laser power has been reached.
As the maximum laser power decreases over time, this will maintain the projectors light output at the preset brightness for longer.



ECO

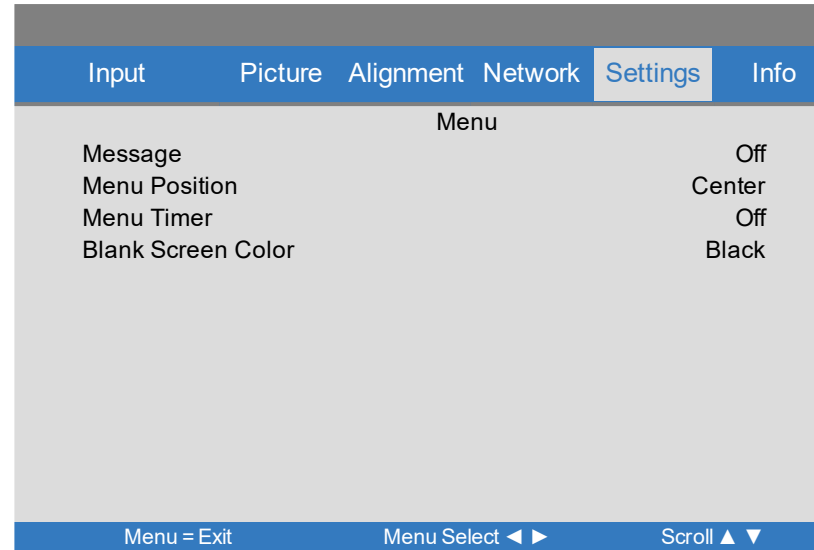
- Standby Power
 - Choose ECO to disable power on by LAN when the projector is in low power mode.
 - Choose **On By LAN** to allow power on by LAN when the projector is in low power mode.
 - Choose **On By HDBase-T** to allow power on by HDBase-T when the projector is in low power mode.
- No Signal Power Off
Set a duration to wait before switching the light source off when there is no input signal. The range is from 0 to 180 minutes in 5 minute increments.
- Sleep Timer
Turns the projector off after a period of time. Set the number of minutes for the timer. Choose from **0, 10, 20, 30, 60, 90, 120, 180, 240, 360, 480** and **600** minutes.



Notes

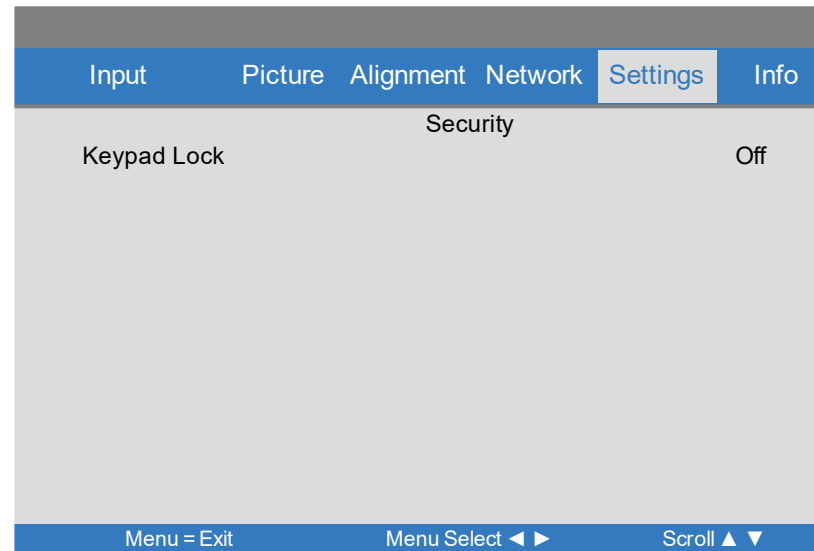
Menu

- **Message**
Set to **On** to display on screen messages.
- **Menu Position**
Choose a position for the menu on the display. Choose from **Center, Up, Down, Left** or **Right**.
- **Menu Timer**
Sets a timer to switch the menu off after a period of no activity. Choose from **Off, 20 Sec, 40 Sec, 60 Sec**.
- **Blank Screen Color**
Select a color for the blank screen function operated by the remote. Choose from **Black** or **Blue**.



Security

- **Keypad Lock**
Switches the keypad lock **On** or **Off**.
Set to **On** to disable the buttons on the control panel. The Power button will still be active.



Notes

Info

Information only.

Input	Picture	Alignment	Network	Settings	Info
Active Source				HDMI 1	
Source Info				1080P30	
Light Hour				0	
IP Address				255.255.255.255	
Software Version				DP V02	
Serial Number				xxxxxxxx	

Menu = Exit Menu Select ◀ ▶ Scroll ▲ ▼

Notes

Served web pages

The served web pages allow you to control the projector remotely via LAN.

Notes

The screenshot displays the web interface for a Digital Projection EV4000 projector. On the left is a navigation menu with four items: Projector Info, Projector Control, Network Setup, and Alert Mail Settings. The main content area shows a table of system and network parameters.

DIGITAL PROJECTION	
Projector Info	
Projector Control	
Network Setup	
Alert Mail Settings	
Model Name	EV4000
System	
System Status	Power On
Display Source	HDMI 1
Lamp Hours	36
Display Mode	HDR
Projection Mode	Front
Light Mode	Normal
Error Status	No Error
LAN Status	
IP address	10.10.10.10
Subnet mask	255.255.255.0
Default gateway	0.0.0.0
DNS Server	0.0.0.0
MAC address	00:18:23:0D:C6:F0
Version	
LAN Version	MHD09
F/W Version	

Notes

DIGITAL PROJECTION

Projector Info
Projector Control
Network Setup
Alert Mail Settings

Power
On Off

Input Selection
HDMI 1 HDMI 2 Computer HDBaseT

DIGITAL PROJECTION

Projector Info
Projector Control
Network Setup
Alert Mail Settings

Projector Name: E-Vision 4000 4K-UHD

Crestron Control

IP Address: 255 . 255 . 255 . 255
IP ID: 65535
Control Port: 0

CAUTION: Incorrect settings will break the Crestron connection.



- Projector Info
- Projector Control
- Network Setup
- Alert Mail Settings

Send E-Mail

Enter the appropriate settings in the fields below:
(Your SMTP server may not require a user name or password.)

SMTP Server: **Port:**

User Name:

Password:

From:

To:

CC:

E-mail Alert Options:

<input type="checkbox"/> Fan lock :	<input type="checkbox"/> Over_Heat:	<input type="checkbox"/>
<input type="checkbox"/> Case Open:	<input type="checkbox"/> Lamp Fail:	<input type="checkbox"/>
<input type="checkbox"/> Lamp Hours Over:	<input type="checkbox"/> Filter Hours Over:	<input type="checkbox"/>
<input type="checkbox"/> Other Error:	<input type="checkbox"/> Weekly Report:	<input type="checkbox"/>



A Delta Associate Company

E-Vision 4000 Series

High Brightness Digital Video Projector

REFERENCE GUIDE

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Appendix A: Product labels

Projector

Notes

DIGITAL PROJECTION DLP Projector / Projecteur DLP (數位投影機/数字投影机)
 Model/Modèle/(型號/型号): **E-Vision 4000 4K-UHD**

AC INPUT/Entrée CA(輸入/輸入): ~ 100-240V 50/60Hz 6.0A

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:
 (1) this device may not cause harmful interference, and
 (2) this device must accept any interference received, including interference that may cause undesired operation.

CAN ICES-003(B) / NMB-003(B)

Caution: Do not open. No user serviceable parts inside.
 警告: 請勿打開外殼, 設備內無服務性維修之元件。
 警告: 請勿打開外殼, 設備內無服務性維修之元件。
 Cuidado: no abra la tapa. Ninguna parte interna es reparable por Usuario.
 Avertissement: ne pas ouvrir le couvercle. Le produit ne contient aucune pièce interne réparable par l'utilisateur.

Caution: Do not open. No user serviceable parts inside.
 Laite on liitettävä suojaköskettimillä varustettuun pistorasiaan
 Apparatet må tilkoples jordet stikkontakt
 Apparatet skall anslutas till jordat uttag
 Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord

Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

LASER RADIATION AVOID DIRECT EYE EXPOSURE
 CLASS 3R LASER PRODUCT Emitted wavelength: 449-461nm
 Max. Pulse energy: 0.698 mJ, Pulse duration: 1.34 ms
 波長: 449-461 nm 最大脈沖能量: 0.698 mJ 脈沖時間: 1.34 ms
 RAYONNEMENT LASER EXPOSITION DIRECTE DANGEREUSE POUR LES YEUX APPAREIL À LASER DE CLASSE 3R Longueur d'onde: 449-461nm
 maximum énergie de impulsion: 0.698mJ durée de impulsion: 1.34ms
 激光輻射 避免眼睛受到直接照射 3R 类激光产品
 波長: 449-461 nm 最大脈沖能量: 0.698 mJ 脈沖時間: 1.34 ms
 GB 7247.1-2012 / IEC 60825-1:2007
 CLASS 3 LASER PRODUCT IEC 60825-1:2014
 PRODUIT LASER DE CLASSE 3 IEC 60825-1:2014

Delta Electronics (Jiangsu) Ltd.
 No.1688, Jiangxing East Rd,
 Wujiang Economic and Technological Development Zone,
 Suzhou City, Jiangsu Province, P.R.C.215200

製造商: Digital Projection Limited
 Greenside Way, Middleton Manchester, M24 1XX UK
 (製造地: 中國) Made in China / 3254683XXX WJ XXXX

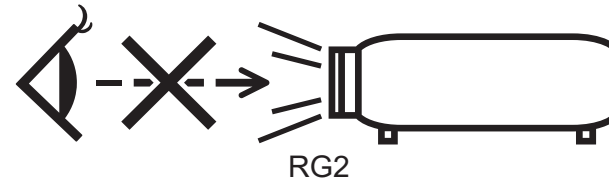
Manufacturers ID & Explanatory Label

Laser Aperture Label

User Guides Label

Part No.: 121-804
Code 39 or 128 (Serial No.)
XXXXXXXXXXXXX
MANUFACTURED YYYY.MM.DD

Serial Number Label



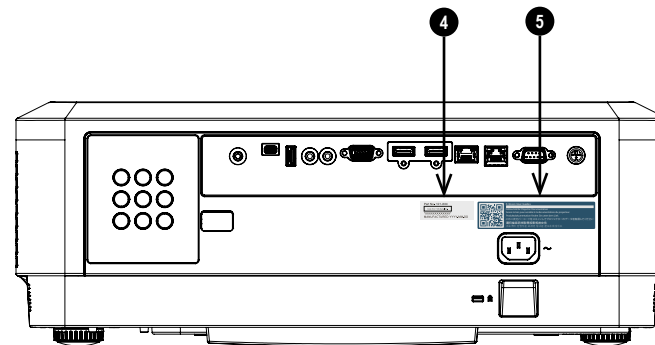
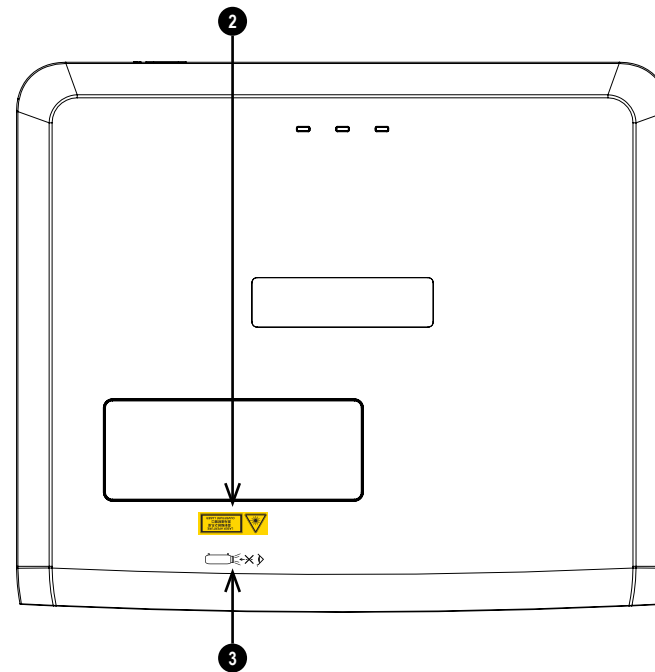
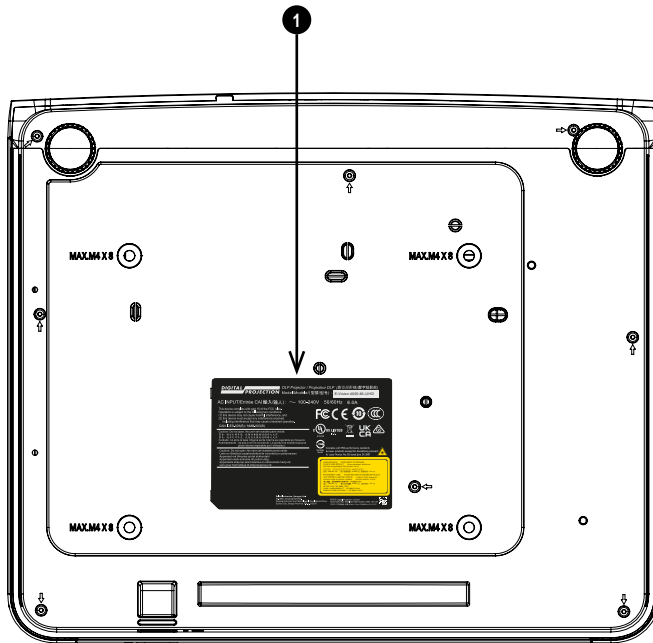
CAUTION: Do not look into the lens

Laser Hazard Warning

Notes

Label Locations

1. Location of Manufacturer's ID Label and Explanatory Label on the bottom of the projector.
2. Location of Laser Aperture Label on the top of the projector.
3. Location of Laser Hazard Warning on the top of the projector.
4. Location of Serial Number Label on the back of the projector.
5. Location of User Guides Label on the back of the projector.



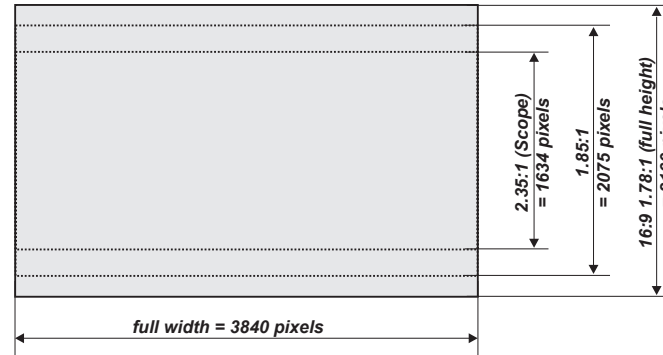
Notes

Appendix B: Screen requirements

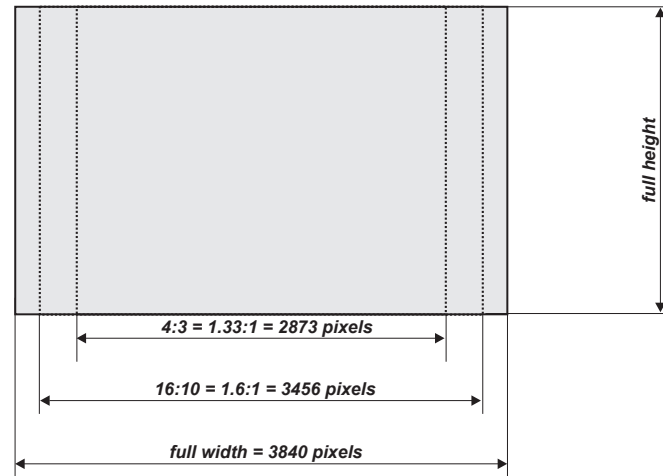
Fitting the image to the display

If the source image supplied to the projector is smaller than the 4K-UHD resolution, the image will not fill the display. The following examples show how a number of common formats may be displayed, depending on your DMD™ resolution.

Images displayed full width of 3840 pixels

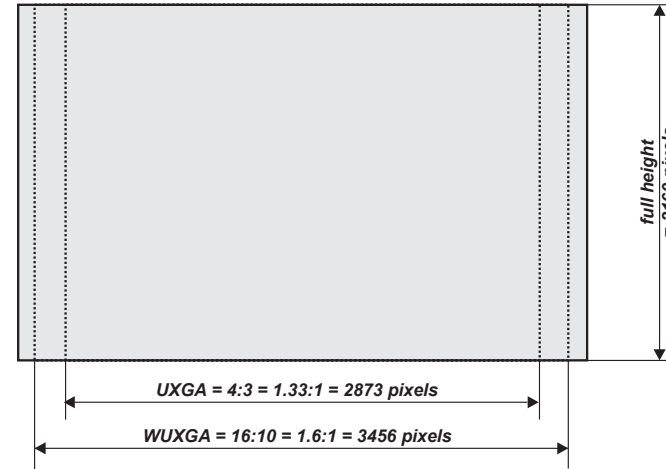


Images displayed with a height of 2160 pixels



Notes

Images displayed full height of 2160 pixels



Notes

Diagonal screen sizes

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

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

2.35:1 (Scope)

$W = D \times 0.92$ $H = D \times 0.39$

1.85:1

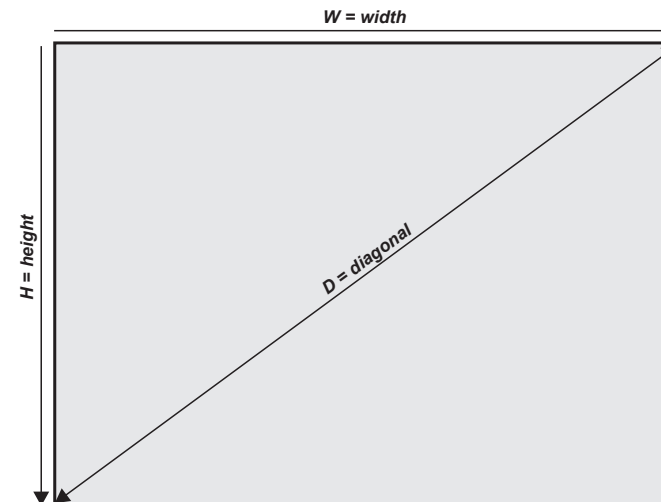
$W = D \times 0.88$ $H = D \times 0.48$

16:9 = 1.78:1 (native aspect ratio for 4K-UHD projectors)

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

16:10 = 1.6:1

$W = D \times 0.85$ $H = D \times 0.53$

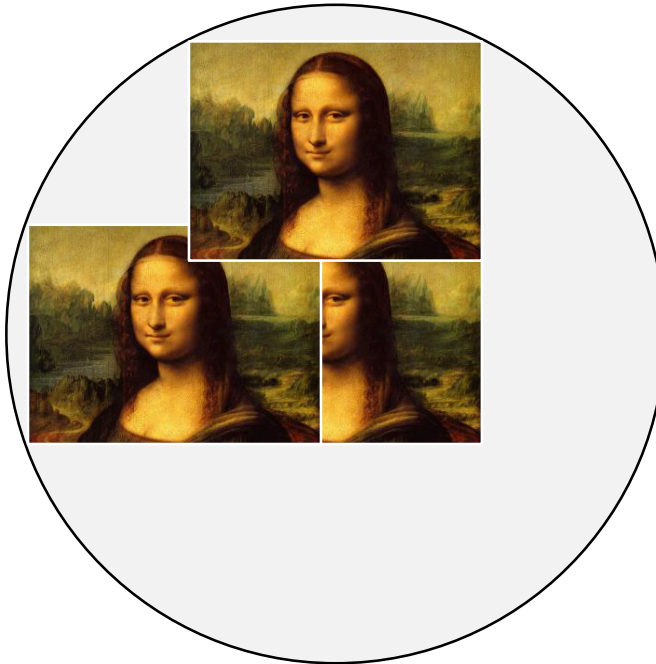


Appendix C: Positioning the image

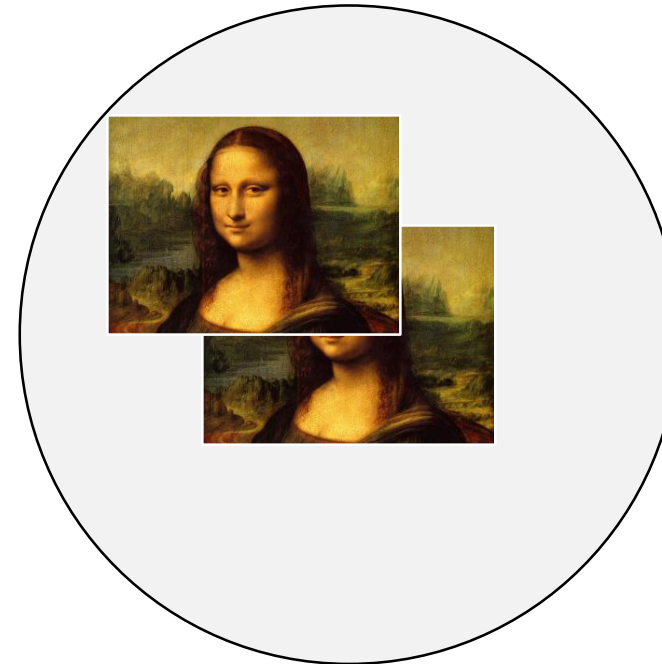
The normal position for the projector is at the center of the screen. However, you can set the projector above or below the center, or to one side, and adjust the image using the **Lens shift** feature (known as **rising and falling front**) to maintain a geometrically correct image.

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.



Full horizontal or vertical shift



Combined shift is reduced

Notes




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


Appendix D: Supported signal input modes


2D formats

Resolution	Frame Rate (Hz)	Interlaced	HDMI (Digital)	HDBase-T (Digital)	VGA (Analog)
480p 4:3	59.94	N	✓	✓	
480p	59.94	N	✓	✓	
480i	59.94	Y	✓	✓	
576i	50	Y	✓	✓	
576p	50	N	✓	✓	
720p50	50	N	✓	✓	
720p60	59.94	N	✓	✓	
1080i50	50	Y	✓	✓	
1080i60	59.94	Y	✓	✓	
1080P24	23.94	N	✓	✓	
1080P25	25	N	✓	✓	
1080P30	29.97	N	✓	✓	
1080p50	50	N	✓	✓	
1080p60	59.94	N	✓	✓	
2160P24	23.94	N	✓	✓	
2160P25	25	N	✓	✓	
2160P30	29.97	N	✓	✓	
2160P50	50	N	✓		
2160P60	59.94	N	✓		
4K2K@24Hz	23.94	N	✓	✓	
4K2K@25Hz	25	N	✓	✓	
4K2K@30Hz	29.97	N	✓	✓	
4K2K@50Hz	50	N	✓		
4K2K@60Hz	59.94	N	✓		
640 x 480	75	N	✓	✓	
800 x 600	75	N	✓	✓	
1024 x 768	75	N	✓	✓	
640 x 480	72	N	✓	✓	
800 x 600	72	N	✓	✓	
720 x 400	70	N	✓	✓	
1024 x 768	70	N	✓	✓	
640 x 480	60	N	✓	✓	✓
800 x 600	60	N	✓	✓	✓

Notes

 ** 4K 50/60Hz only supports YUV:420 8bit (HDMI)

 ** 4K 24/25/30Hz does not support 10/12bit (HDBaseT)

 ** 4K does not support VS2000 HDBaseT devices

Resolution	Frame Rate (Hz)	Interlaced	HDMI	HDBase-T	VGA
			(Digital)	(Digital)	(Analog)
1024 x 768	60	N	✓	✓	✓
1280 x 720	60	N	✓	✓	✓
1280 x 768	60	N	✓	✓	✓
1280 x 1024	60	N	✓	✓	✓
1280 x 960	60	N	✓	✓	✓
1360 x 768	60	N	✓	✓	✓
1400 x 1050	60	N	✓	✓	✓
1440 x 900	60	N	✓	✓	✓
1600 x 1200	60	N	✓	✓	✓
1680 x 1050	60	N	✓	✓	✓
1920 x 1080	60	N	✓	✓	✓
1920 x 1200	60	N	✓	✓	✓

Notes

3D formats

Resolution	Freq (Hz)	Remarks
1920x1080P	23	Frame Packing
1920x1080P	24	Frame Packing
1280x720P	59	Frame Packing
1280x720P	60	Frame Packing
1280x720P	50	Frame Packing
1920x1080i	59	Side by side
1920x1080i	60	Side by side
1920x1080i	50	Side by side
1920x1080P	23	Top and Bottom
1920x1080P	23	Top and Bottom
1280x720P	59	Top and Bottom
1280x720P	60	Top and Bottom
1280x720P	50	Top and Bottom

Notes

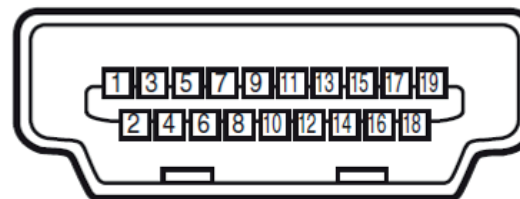
Appendix E: Wiring details

Signal inputs and outputs

HDMI

19 way type A connector

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

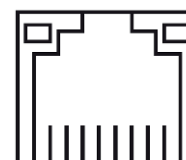


HDMI: pin view of panel connector

HDBaseT input

RJ45 socket.

1. DATA 0+
2. DATA 0-
3. DATA 1+
4. DATA 2+
5. DATA 2-
6. DATA 1-
7. DATA 3+
8. DATA 3-



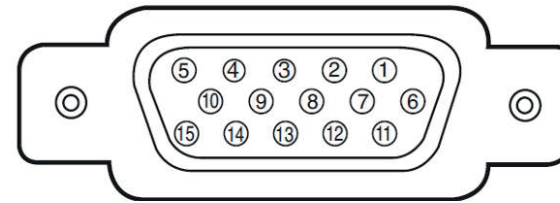
87654321

HDBase-T

Notes

VGA input

1. Red input
2. Green input
3. Blue input
4. not connected
5. not connected
6. Ground
7. Ground
8. Ground
9. +5 V Power
10. Ground
11. Ground
12. VGA_SDA
13. H-Sync
14. V-Sync
15. VGA_SCL
16. Ground



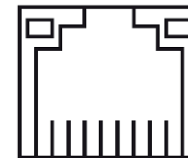
VGA: pin view of panel connector

Control connections

LAN

RJ45 socket


1. TX+
2. TX-
3. TXC
4. Ground
5. Ground
6. RXC
7. RX+
8. RX-



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LAN: pin view of panel connector

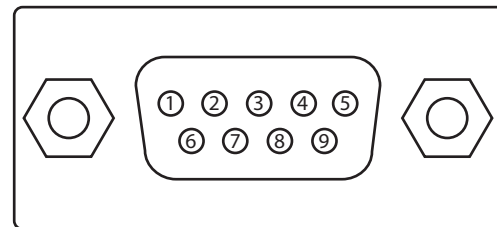
Notes

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

RS232

9 way D-type connector

1. not connected
2. Received Data (RX)
3. Transmitted Data (TX)
4. not connected
5. Ground
6. not connected
7. Short with pin8
8. Short with pin7
9. not connected

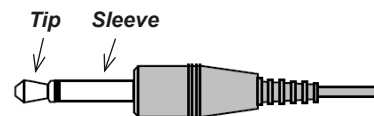


RS232: pin view of panel male connector

Notes**Trigger**

3.5 mm mini jack, Output: 12V, 200 mA max

- **Tip** Signal
- **Sleeve** Ground



Appendix F: Glossary of terms*Notes***1****1080p**

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

3**3D active glasses**

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

3D passive glasses

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

4**4K-UHD**

The 4K-UHD resolution of 3840 × 2160 is the dominant 4K resolution used in the consumer media and display industries. This resolution has an aspect ratio of 16 :9, with 8,294,400 total pixels.

A**Adjust lines**

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

Anamorphic lens

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

Aperture

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

Aspect ratio

The proportional relationship between the width and the height of the projected image. It is represented by two numbers separated by a colon, indicating the ratio of image width and height respectively: for example, 16:9 or 2.35:1. Not to be confused with resolution.

B**Blanking (projection)**

The ability to intentionally turn off, that is, set to black, areas around the edges of the projected image. It is sometimes referred to as “curtains” since it can be used to blank an area of image that literally falls on the curtains at the side of the screen in a movie theater. Usually no image resizing or geometric correction takes place and the “blanked” part of the image is lost. Not to be confused with horizontal and vertical blanking (video signal).

Blanking (video signal)

The section of the video signal where there is no active video data. Not to be confused with blanking (projection).

Blend region

The area of the image that is to overlap with another image in an edge blend setup. Sometimes called overlapping region.

Brightness (electronic control)

A control which adds a fixed intensity value to every pixel in the display, moving the entire range of displayed intensities up or down, and is used to set the black point in the image (see Contrast). In Component Video signals, brightness is the same as luminance.

Brightness (optical)

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

C**C**

Also known as ‘Chrominance’, this is the component, or pair of components, of a Component Video signal which describes color difference information.

Chrominance

Also known as ‘C’, this is the component, or pair of components, of a Component Video signal which describes color difference information.

Color difference

In Component Video signals, the difference between specified colors and the luminance component. Color difference is zero for monochrome images.

Color gamut

The spectrum of color available to be displayed.

Color temperature

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

Notes

Component video

A three-wire or four-wire video interface that carries the signal split into its basic RGB components or luminance (brightness) and two-color difference signals (YUV) and synchronization signals.

Contrast (electronic control)

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

Contrast (optical)

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

Cr, Cb

Color difference signals used with 'Y' for digital Component Video inputs. They provide information about the signal color. Not to be confused with Pr, Pb.

Crop

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

D**Dark time**

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

DDC (Display Data Channel)

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

Deinterlacing

The process of converting interlaced video signals into progressive ones.

DHCP (Dynamic Host Configuration Protocol)

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

DMD™ (Digital Micromirror Device™)

The optical tool that transforms the electronic signal from the input source into an optical image projected on the screen. The DMD™ of a projector has a fixed resolution, which affects the aspect ratio of the projected image. A Digital Micromirror Device™ (DMD™) consists of moving microscopic mirrors. Each mirror, which acts as a pixel, is suspended between two posts by a thin torsion hinge. It can be tilted to produce either a bright or dark pixel.

E**Edge blend**

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

Edge tear

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

EDID (Extended Display Identification Data)

Information stored in the projector that can be read by the source. EDID is used on the HDMI, DVI and VGA inputs, allowing the source to automatically configure to the optimum display settings.

EDTV (Enhanced Definition Television)

A progressive digital television system with a lower resolution than HDTV.

F**Field**

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

Frame

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

Frame rate

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

Frame rate multiplication

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

G**Gamma**

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

Ghosting

An artifact in 3D image viewing. Ghosting occurs when an image intended for one eye is partially seen by the other eye. Ghosting can be removed by optimizing the dark time and sync delay.

Notes

H

HDCP (High-bandwidth Digital Content Protection)

An encryption scheme used to protect video content.

HDTV (High Definition Television)

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

Hertz (Hz)

Cycles per second.

Horizontal Scan Rate

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

Hs + Vs

Horizontal and vertical synchronization.

Hue

The graduation (red/green balance) of color (applicable to NTSC).

I

Interlacing

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

Interleaving

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

L

LED (Light Emitting Diode)

An electronic component that emits light.

Letterboxing

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

Notes

Lumen

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

Luminance

Also known as 'Y', this is the part of a Component Video signal which affects the brightness, i.e. the black and white part.

N

Noise

Electrical interference displayed on the screen.

NTSC (National Television Standards Committee)

The United States standard for television - 525 lines transmitted at 60 interlaced fields per second

O

OSD (on-screen display)

The projector menus allowing you to adjust various settings.

Overlapping region

The area of the image that is to overlap with another image in an edge blend setup. Sometimes called overlapping region.

P

PAL (Phase Alternate Line)

The television system used in the UK, Australia and other countries - 625 lines transmitted at 50 interlaced fields per second.

Pillarboxing

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

Pixel

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

Pond of mirrors

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

Notes

Pr, Pb

Color difference signals used with 'Y' for analog Component Video inputs. They provide information about the signal color. Not to be confused with Cr, Cb.

Primary colors

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

Progressive scanning

A method of updating the image in which the lines of each frame are drawn in a sequence, without interlacing.

Pulldown

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

R**Resolution**

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

RGB (Red, Green and Blue)

An uncompressed Component Video standard.

S**Saturation**

The amount of color in an image.

Scope

An aspect ratio of 2.35:1.

SDTV (Standard Definition Television)

An interlaced television system with a lower resolution than HDTV. For PAL and SECAM signals, the resolution is 576i; for NTSC it is 480i.

SECAM (Sequential Color with Memory)

The television system used in France, Russia and some other countries - 625 lines transmitted at 50 interlaced fields per second.

Smooth picture

A feature that can display a higher resolution source than the native resolution of the projector without losing any pixel data.

SX+

A display resolution of 1400 x 1050 pixels with a 4:3 screen aspect ratio. (Shortened from SXGA+, stands for Super Extended Graphics Array Plus.)

Synchronization

A timing signal used to coordinate an action.

T

Test pattern

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

TheaterScope

An aspect ratio used in conjunction with a special anamorphic lens to display 2.35:1 images packed into a 16:9 frame.

Throw distance

The distance between the screen and the projector.

Throw ratio

The ratio of the throw distance to the screen width.

TRC (Throw ratio correction)

A special number used in calculating throw distances and throw ratios when the image does not fill the width of the DMD™. TRC is the ratio of the DMD™ aspect ratio to the image source aspect ratio: $TRC = \text{DMD}^{\text{TM}} \text{ aspect ratio} / \text{Source aspect ratio}$ TRC is only used in calculations if it is greater than 1.

U

UXGA

A display resolution of 1600 x 1200 pixels with a 4:3 screen aspect ratio. (Stands for Ultra Extended Graphics Array.)

V

Vertical Scan Rate

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

Vignetting

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

Vista

An aspect ratio of 1.66:1.

Notes

W

WUXGA

A display resolution of 1920 x 1200 pixels with a 16:10 screen aspect ratio. (Stands for Widescreen Ultra Extended Graphics Array.)

Y

Y

This is the luminance input (brightness) from a Component Video signal.

YUV

Color difference signals used with 'Y' for analog Component Video inputs. They provide information about the signal color. Not to be confused with Cr, Cb.

Z

ZScreen

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

Notes



A Delta Associate Company

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