

***TITAN 1080p-600, Reference 1080p,
TITAN 1080p-700, 1080p Ultra Contrast***

**High Brightness Digital Video Projector
16:9 widescreen display**

User Manual



Declaration of Conformity

Directives covered by this Declaration

2004/108/EC Electromagnetic Compatibility Directive.

2006/95/EC Low Voltage Equipment Directive.

Products covered by this Declaration

Large screen video projector type

TITAN 1080p-600

TITAN 1080p-700

TITAN Reference 1080p

TITAN 1080p-Ultra Contrast

The CE mark was first applied in:

October 2007

June 2008

October 2007

June 2008

Basis on which Conformity is being declared

The products identified above comply with the protection requirements of the above EU directives, and the manufacturer has applied the following standards.

EN 55022:1998 - Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment.

EN 55024:1998 - Limits and Methods of Measurement of Immunity Characteristics of Information Technology Equipment.

EN 55103:1997 - Product family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control apparatus for Professional Use.

EN 60950-1:2001 - Specification for Safety of Information Technology Equipment, including Electrical Business equipment.

The technical documentation required to demonstrate that the products meet the requirements of the Low Voltage directive has been compiled by the signatory below and is available for inspection by the relevant enforcement authorities.

Signed:



Authority:

D.J. Quinn, Product Development Director

Date:

13 June 2008

Attention!

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures are available on request, and are also contained in the product manuals.

Important Information

Please read this user manual carefully before using the projector, and keep the manual handy for future reference.

A serial number is located on the side of the projector. Record it here:

Symbols used in this guide

Warnings



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.

Trademarks

- IBM is a registered trademark of International Business Machines Corporation.
- Macintosh and PowerBook are registered trademarks of Apple Computer, Inc.
- Other product and company names mentioned in this user's manual may be the trademarks of their respective holders.

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. Projectors built prior to this revision of the User Manual may therefore not include all the features described.

Manual revision

Date	Description	Revision
March 2008		Rev A
August 2008	700 and Ultra Contrast added	Rev B
August 2009	Userware added, various corrections, revisions	Rev C

General precautions

Notes



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

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 authorised 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.



There are no user-serviceable parts inside the lamp module. The whole module should be replaced.

Only lamps supplied by Digital Projection and intended for this projector should be used. Fitting any other lamp could damage both projector and lamp, and will invalidate the warranty.

Take care when removing the lamp module.

NEVER touch the lamp or reflector.

Take care not to touch the glass surface of the lamp module. If you do accidentally touch the glass, it should be cleaned before use. (see section 5. Maintenance.)

Do not use the lamp for more than 2000 hours, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.

HID lamps produce high intensity light. Do not look directly at the light coming from the lamp housing, or the lens, or allow items such as magnifying lenses to be placed in the light path. This could result in serious eye damage.

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, moving the projector or changing the lamp.

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

Installation precautions



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

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

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 30cm (12in) of space between the ventilation outlets and any wall, and 10cm (4in) 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 projector weighs approximately 31 kg (68 lbs). Use safe handling techniques when lifting the projector.

When stacking projectors, the stack **MUST** be vertical, to ensure that the stresses are distributed to all frame couplings.

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 (see specification for exact weights).

Separate backup safety chains or wires should always be used for each projector.

Do not place heavy objects on top of the projector chassis. Only the chassis corners and the rigging frame are capable of withstanding the weight of another projector.

Do not stack more than 3 projectors.

Do not drop or knock the projector.

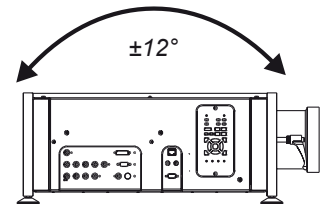
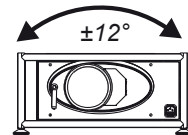
The lens release lever should always be set to the locked position to prevent the lens from falling out.

Each time a new lens is fitted to the projector, the calibration procedure must be carried out. See Setup menu, in Section 4. Controlling the projector.

Place the projector in a dry area away from sources of dust, moisture, steam, smoke, sunlight or heat.

Do not tilt the projector more than $\pm 12^\circ$ in either direction when in use, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.

Notes



It may be possible to use the projector in other orientations, depending on lamp configuration. For more information, contact Digital Projection.

Operation and configuration precautions

Notes



Do not make changes to the networking configuration unless you understand what you are doing, or have taken advice from your Network Manager. If you make a mistake, it is possible that you will lose contact with the projector. Always double-check your settings before pressing the APPLY button. Always keep a written note of the original settings, and any changes you have made.

Software update should NOT be carried out except by, or with the supervision of, Digital Projection Service personnel.

Compliance with international standards

Noise

GSGV Acoustic Noise Information Ordinance

The sound pressure level is less than 70 dB (A) according to ISO 3744 or ISO 7779.

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 A 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.

This equipment contains an FCC approved RF transmitter module with FCC ID: R68WIPOPT.

European Waste Electrical and Electronic Equipment (WEEE) Directive



Digital Projection Ltd is fully committed to minimising 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 minimised.

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Titan 1080p-600/700, Reference, Ultra Contrast User Manual

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1. Introduction

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What's in the box?

- Make sure your box contains everything listed. If any pieces are missing, contact your dealer.
- You should save the original box and packing materials, in case you ever need to ship your Projector.



Projector
 (1080p-600: 107-302, with SDI: 108 643
 Reference 1080p: 107-973, with SDI 108 644
 1080p-700: 108-722
 1080p Ultra Contrast: 108-781)

Notes



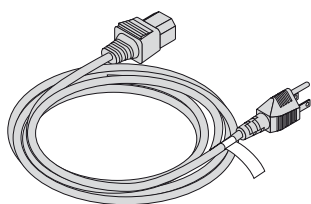
Lenses are optional. Order lenses from your Digital Projection dealer.



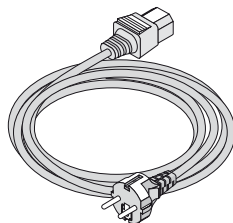
*For more detailed information about lenses, see **Choosing a lens**, in **section 2. Installation**.*



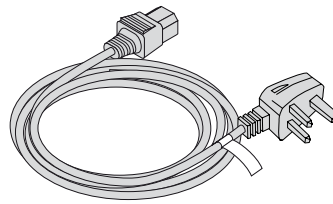
Only one power cable - dependent on the destination territory - will be supplied with the projector.



Power cable 10A
Europe
(102-163)



Power cable 13A
North America
(102-165)



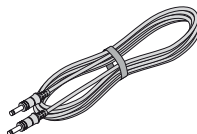
Power cable 10A
United Kingdom
(102-180)



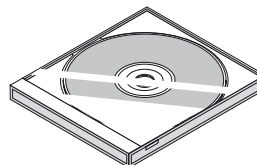
Remote control
(105-023)



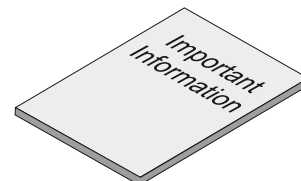
4x AAA batteries
(105-922)



Remote cable 5m
(102-162)



User manual on CD
(105-923)



Important Information
(108-467)

Key features of the projector

Congratulations on your purchase of the Digital Projection Titan 1080p-600/700, Reference or Ultra Contrast projector.

Digital Projection International, Texas Instruments' first DLP™ partner and the original innovator of the 3-chip DLP™ projector, proudly introduces the Titan 1080p. Incredibly bright, high resolution and high in contrast, the Titan 1080p offers a radically new electronics configuration ideally suited for the staging and large-venue permanent installation markets.

The Titan 1080p harnesses the power of the Texas Instruments' 1920 x 1080 pixel HPO DMD's™. Alongside the LIGHTNING and HIGHlite Pro, the Titan 1080p is to set new standards for Staging and is destined to be the first choice of professionals who stage prestigious events such as the Grammy® Awards and the Oscars®. With a contrast of 2000:1 and awe-inspiring brightness of 10000 lumens, the Titan 1080p is unmatched for applications as diverse as world class staged events, commercial entertainment, major outdoor venues, large-scale simulation, gaming, home theatre and houses of worship.

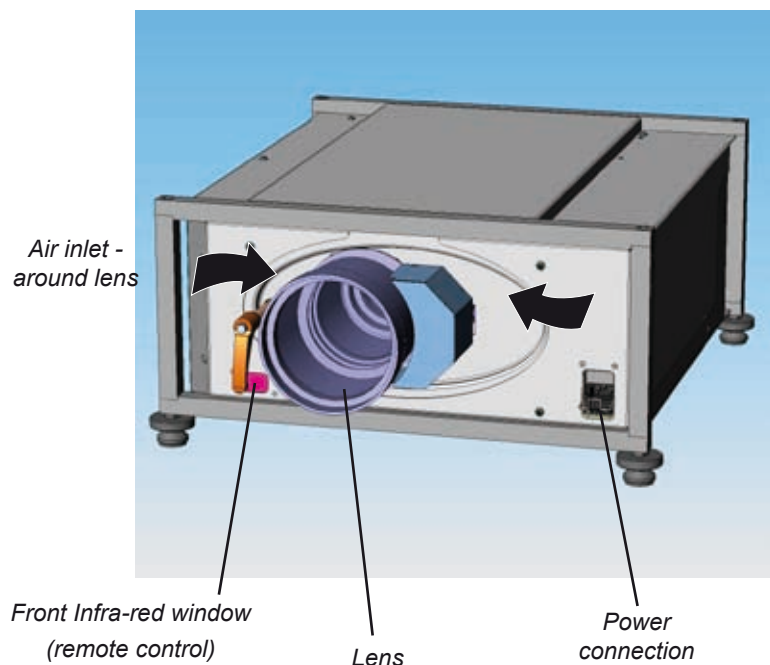
Key Features

- High resolution, large venue projector
 - Applications: Large Screen; Fixed install and Rental
 - 1080p-600: 10000 ANSI lumens ±10%
 - Reference: 4000 ANSI lumens ±10%
 - 1080p-700: 10000 ANSI lumens ±10%
 - Ultra Contrast: 5000 ANSI lumens ±10%
 - 600 and 700 Contrast 2000:1 ±10%
 - Reference and Ultra Contrast: Contrast 5000:1 ±10%
 - 1920 x 1080 resolution
 - Precision mechanical design ensuring maximum amount of light from lamp housing reaches optics, without any operator adjustment
 - 600 and Reference: 850W single phase, 100-240VAC ±10%
 - 700 and Ultra Contrast: 950W single phase, 100-240VAC ±10%
 - Compact size, light weight - approximately 31 kg (68 lbs)
 - Intelligent motorised lens mount
 - Optional Rigging frame with Quick-lock stack system- 3 point pitch & roll adjustment for accurate alignment
 - Ruggedised robust metal case
 - LAN & RS232 connection for network operation
 - Six/Seven selectable Digital and Analogue Video inputs for display of the latest as well as legacy video standards.
- DVI, SD and HD SDI, RGBHV, Component, S-Video, Composite all as standard. (SDI not present on earlier models)
- Wi-fi connection wireless remote control
 - IR/cable remote control for easy setup
 - LAN operation using control codes or Integrated Userware

Notes

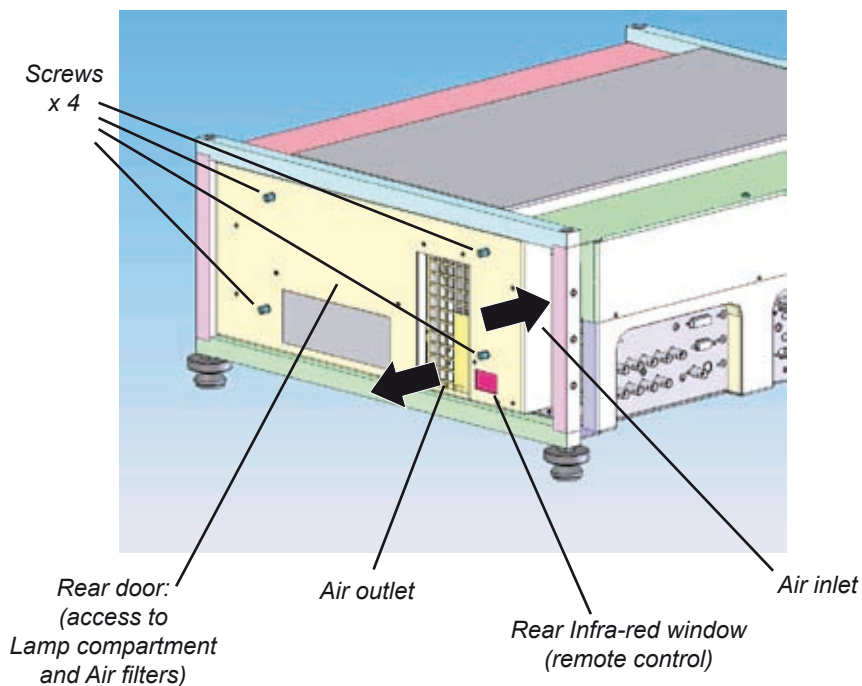
Getting to know the projector

Front panel, – lens and power



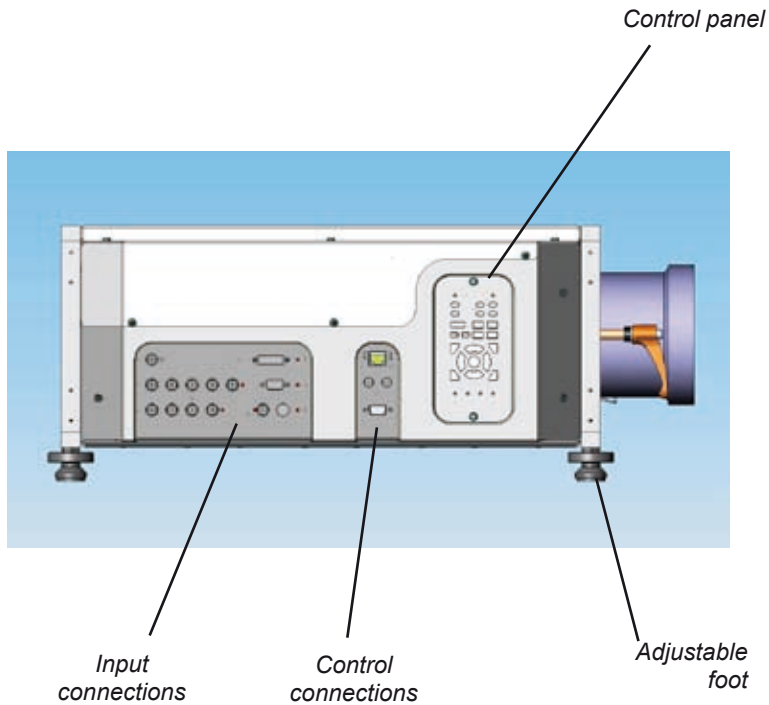
For more detailed information about lenses, see **section 2. Installation**

Rear panel – lamp and air filter



For information about how to change the lamp or the filter, see **section 6. Maintenance**.

Side panel – connection and control



Notes

 For information about how to connect the projector, see **Connecting the projector** in section 2. **Installation**, and **Connections** in section 7. **Appendix**.

 For information about how to use the control panel, see section 4. **Controlling the projector**.

 For information about how to mount and stack projectors, see section 2. **Installation**.

2. Installation

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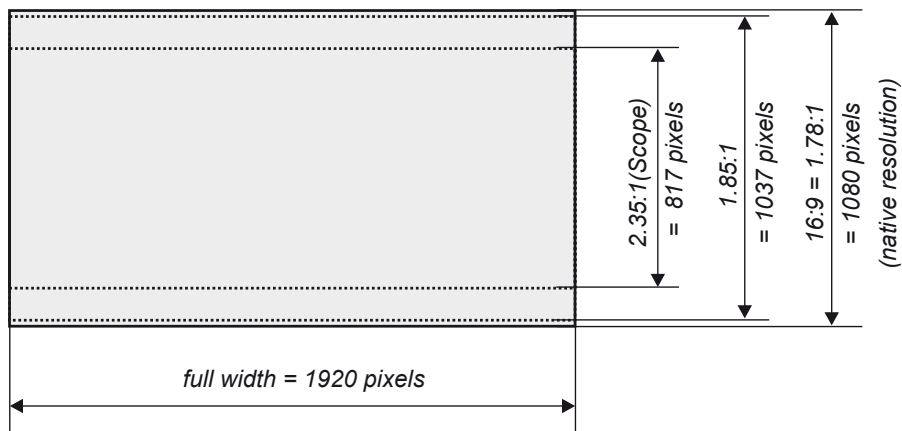
Screen requirements

Aspect ratio

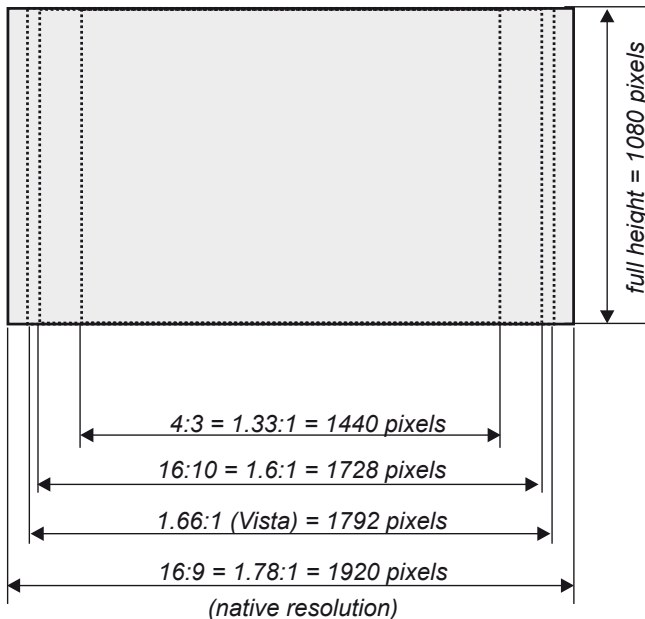
Fitting the image to the DMD

If the source image supplied to the projector is smaller than 1920 x 1080 pixels, then the image will not fill the DMD. The following example shows how a number of common formats may be displayed.

Images displayed full width



Images displayed full height



Notes

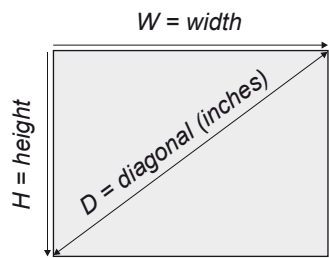


The images are shown here scaled automatically by the projector.

The image may be scaled differently if the Aspect Ratio is set differently in the Picture or Geometry menus.

Diagonal screen sizes

Screen sizes are sometimes specified by their diagonal size (D) in inches. 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 in inches into width and height, at various aspect ratios.

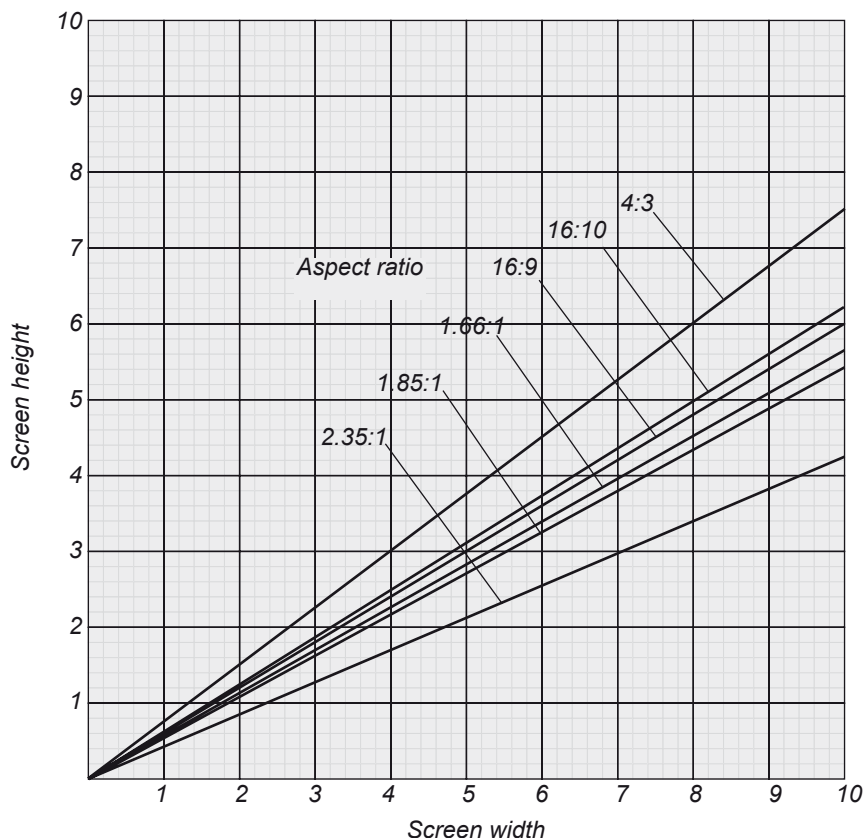
2.35:1 (Scope)			
W = D x 0.92in	(D x .023m)	H = D x 0.39in	(D x .01m)
1.85:1			
W = D x 0.88in	(D x .022m)	H = D x 0.47in	(D x .012m)
16:9 = 1.78:1 (native aspect ratio)			
W = D x 0.87in	(D x .022m)	H = D x 0.49in	(D x .0125m)
1.66:1 (Vista)			
W = D x 0.86in	(D x .022m)	H = D x 0.52in	(D x .013m)
16:10 = 1.6:1			
W = D x 0.85in	(D x .022m)	H = D x 0.53in	(D x .014m)
4:3 = 1.33:1			
W = D x 0.8in	(D x .02m)	H = D x 0.6in	(D x .015m)

Notes

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, or the sample calculations below 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.

**2.35:1 (Scope)**

$$W = H \times 2.35 \quad H = W \times 0.426$$

1.85:1

$$W = H \times 1.85 \quad H = W \times 0.54$$

16:9 = 1.78:1 (native aspect ratio)

$$W = H \times 1.78 \quad H = W \times 0.56$$

1.66:1 (Vista)

$$W = H \times 1.66 \quad H = W \times 0.6$$

4:3 = 1.33:1

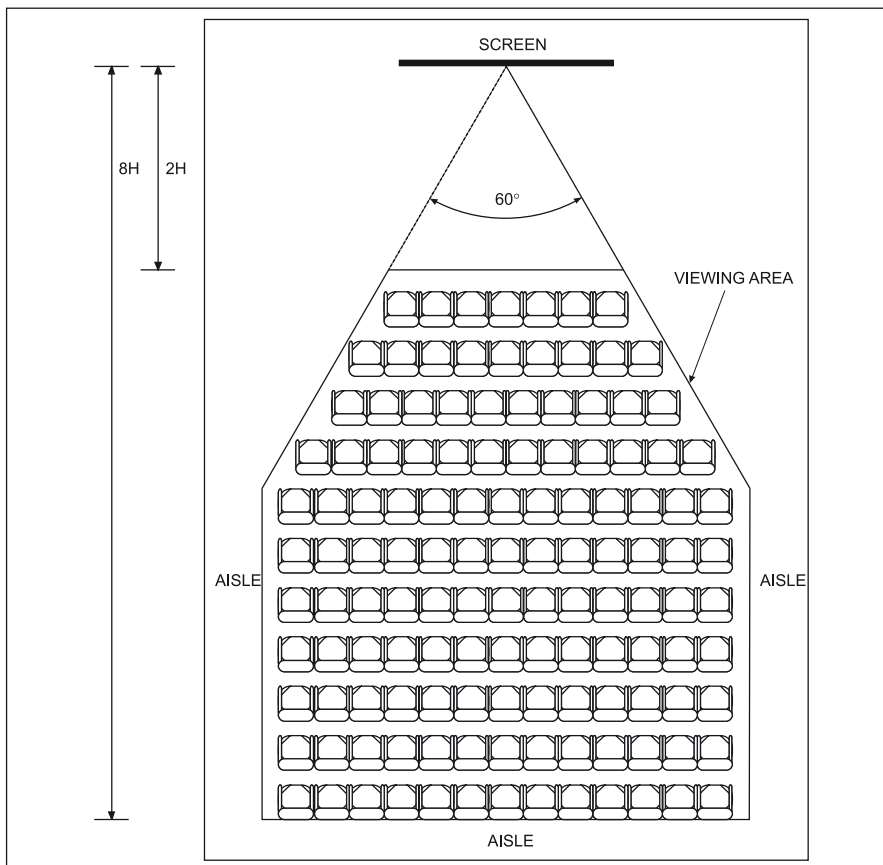
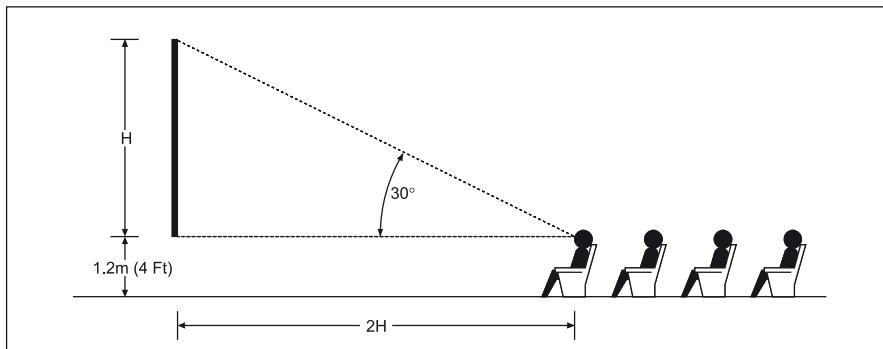
$$W = H \times 1.33 \quad H = W \times 0.75$$

Notes

Positioning the screen and projector

For optimum viewing, the screen should be a flat surface perpendicular to the floor. The bottom of the screen should be 1.2m (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 30cm (12in) of space between the ventilation outlets and any wall, and 10cm (4in) 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 **section 4. Using the menus, Image menu**) 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.

Choosing a lens

A number of lenses are available for use with the projector. Which lens you choose will depend on the screen size, image aspect ratio, projection distance and light output.

The lenses available and their part numbers are listed below:

	High Brightness	High Contrast
0.67 : 1 fixed lens	105-607	107-195
1.12 : 1 fixed lens (3 - 15m)	105-608	105-608
1.12 : 1 zoom lens (1.2 - 2m)	105-609	105-609
1.16 - 1.49 : 1 zoom lens	109-236	109-359
1.39 - 1.87 : 1 zoom lens	105-610	107-196
1.87 - 2.56 : 1 zoom lens	105-611	107-197
2.56 - 4.16 : 1 zoom lens	105-612	107-198
4.16 - 6.96 : 1 zoom lens	105-613	107-199
6.92 - 10.36 : 1 zoom lens	109-235	109-358

If you are simply connecting the output of a camera or computer directly to the projector, then the image size (in pixels) may well be fixed. If, however, you are using commercially available image processing equipment, such as the Digital Projection VIP1000, you may be able to resize the image to fit the DMD.

If the image does not fill the full width of the DMD, this effectively increases the throw ratio of the lens. This can be corrected for by applying a Throw ratio factor.

Method one: using the lens charts

For the screen sizes listed below, use the charts on the following pages, to choose the most suitable lens.

Full width images, including:

2.35:1 (Scope)	1920 x 817 pixels
1.85:1	1920 x 1037 pixels
16:9 = 1.78:1	1920 x 1080 pixels (native resolution)

Full height images

A Throw ratio factor (TRF) has been applied to the following charts:

1.66:1 (Vista)	1792 x 1080 pixels	TRF = 1.07
16:10 = 1.6:1	1728 x 720 pixels	TRF = 1.11
4:3 = 1.33:1	1440 x 1080 pixels	TRF = 1.33

Method two: by calculation

See the calculations, on the page immediately following the lens chart.

Notes



The High Brightness lenses are recommended for the 1080p-600 and 1080p-700, for maximum light output.

The High Contrast lenses are recommended for the Reference 1080p and 1080p Ultra Contrast, for maximum contrast.



Each time a new lens is fitted to the projector, the calibration procedure must be carried out. See Setup menu, in Section 4. Controlling the projector.



*For more information about Throw ratio factor (TRF), see **Useful lens calculations**, later in this section.*

Choosing a lens using the lens charts

Use the charts on this page and on the following pages to choose which lens best suits your application.

Full width images, including 2.35:1, 1.85:1 and 16:9 (native resolution)

example

- For a screen width of 10m at a distance of 30m, the 2.56- 4.16: 1 zoom lens would be best suited.
- For the same screen size at a distance of 50m, the 4.16 - 6.96: 1 zoom lens would be best suited.

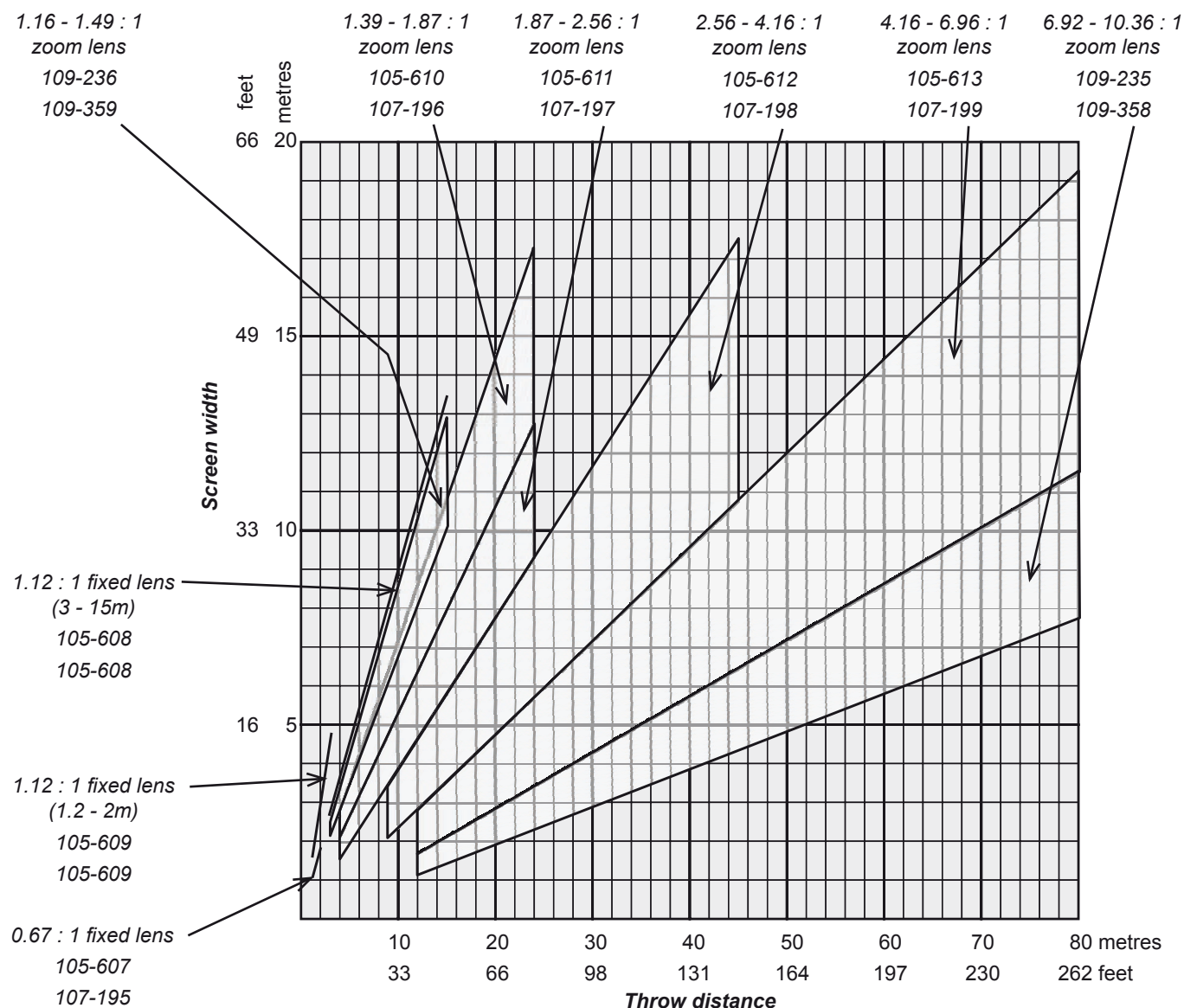
if you need to be more precise, then use the calculations on the page immediately following the lens charts.

Notes



This chart has a TRF of 1.0, for use with the following images:

2.35:1 (Scope),
1.85:1 and 16:9



*Lens charts continued***Full height image 1.66:1 (Vista)**

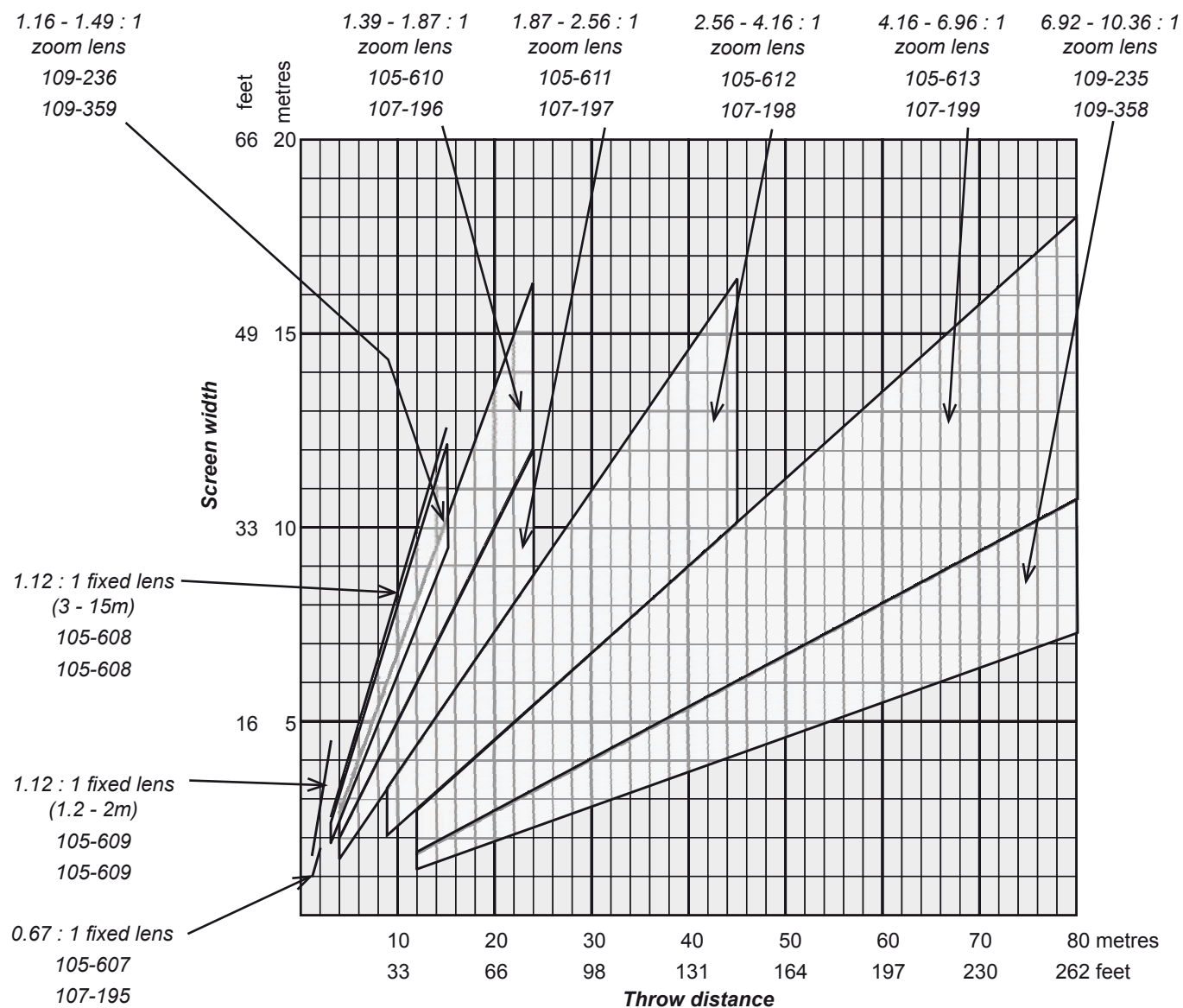
Use the chart below to choose which lens best suits your application.

if you need to be more precise, then use the calculations on the page immediately following the lens charts.

Notes

This chart has a TRF of 1.07, for use with the following images:

1.66:1 (Vista)



*Lens charts continued***Full height image 1.6:1**

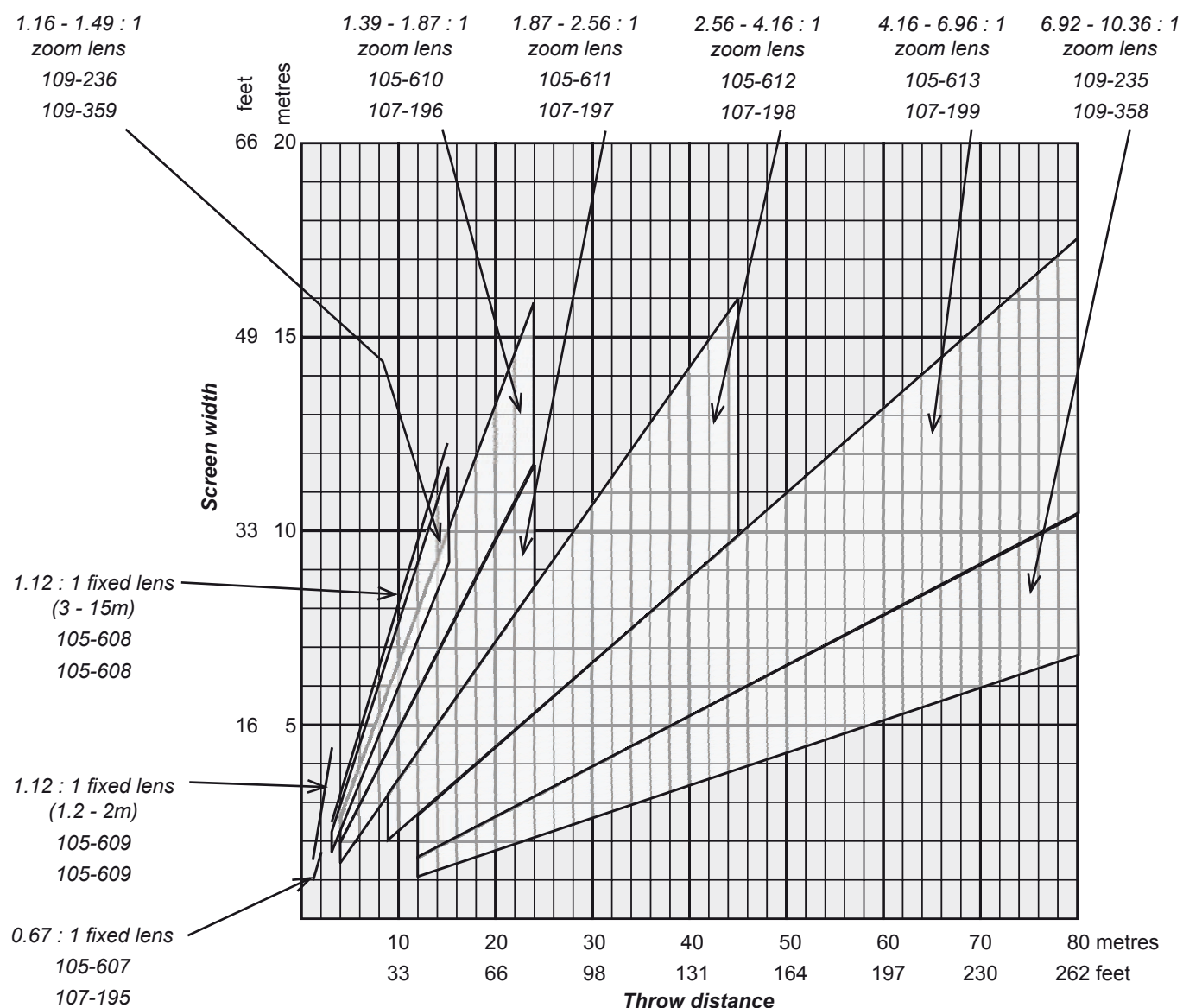
Use the chart below to choose which lens best suits your application.

if you need to be more precise, then use the calculations on the page immediately following the lens charts.

Notes

This chart has a TRF of 1.1, for use with the following images:

1.6:1



*Lens charts continued***Full height image 4:3**

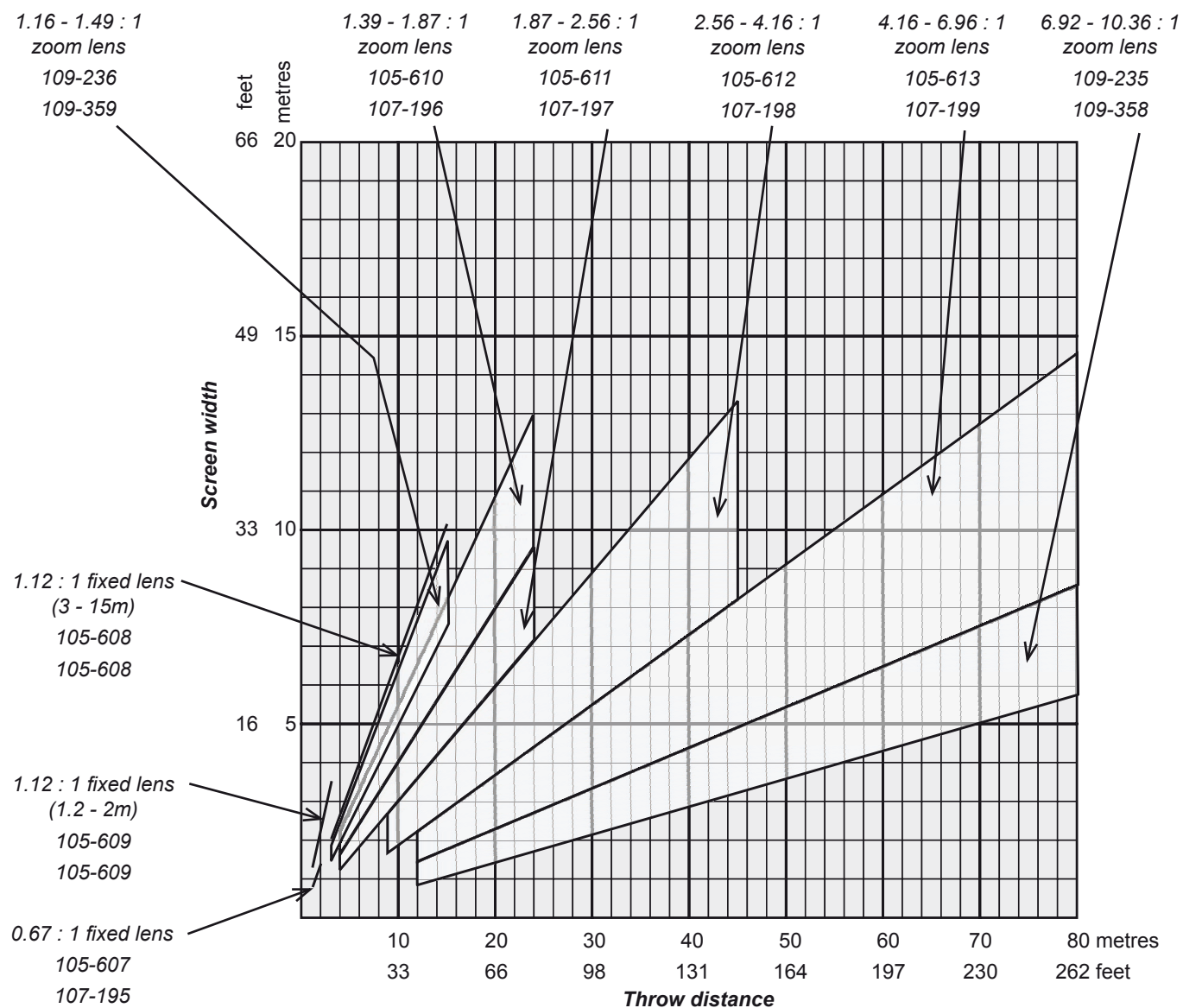
Use the chart below to choose which lens best suits your application.

if you need to be more precise, then use the calculations on the page immediately following the lens charts.

Notes

This chart has a TRF of 1.33, for use with the following images:

4:3 = 1.33



Choosing a lens by calculation

For any screen size not listed above, or if you need to be more precise, then use the calculations below.

- Identify actual width of the image in pixels.
- Calculate the Throw Ratio Factor:
$$\text{TRF} = \frac{\text{DMD width (1920)}}{\text{Image width in pixels}}$$
- Identify the screen width required.
- Identify the throw distance required.

Throw distance calculations are based on the distance from the outer end of the lens, which will vary from lens to lens. Once a lens has been chosen, the figures can be checked using the lens extension values given on the next page.

- Calculate the throw ratio required.
$$\text{Throw ratio} = \frac{\text{Throw distance}}{\text{Screen width} \times \text{TRF}}$$
- Choose a lens with the required throw ratio from the list at the bottom of the page.

Check from the list that the lens chosen will work at the throw distance required.

example

- An image, 1024 x 768 pixels, screen width 6.5m, throw distance 18m from the outer end of the lens.
- Throw Ratio Factor (TRF) =
$$\frac{1920}{1024} = 1.875$$
- Throw ratio required =
$$\frac{18}{6.5 \times 1.875} = 1.48$$
- Choose the 1.39 - 1.87 zoom lens.

Notes



The Throw ratio for a particular lens is fixed, and assumes that the image fills the width of the DMD.

For images that do not fill the width of the DMD, the Throw ratio is effectively increased. To correct for this, a Throw Ratio Factor (TRF) is used.

	High Brightness	High Contrast	Throw distance range
0.67 : 1 fixed lens	105-607	107-195	1.1 - 3.2m (3.6 - 10.5ft)
1.12 : 1 fixed lens (3 - 15m)	105-608	105-608	3 - 15m (9.8 - 49.2ft)
1.12 : 1 fixed lens (1.2 - 2m)	105-609	105-609	1.2 - 2m (3.9 - 6.6ft)
1.16 - 1.49 : 1 zoom lens	109-236	109-359	3 - 15m (9.8 - 49.2ft)
1.39 - 1.87 : 1 zoom lens	105-610	107-196	4 - 24m (13.1 - 78.7ft)
1.87 - 2.56 : 1 zoom lens	105-611	107-197	4 - 24m (13.1 - 78.7ft)
2.56 - 4.16 : 1 zoom lens	105-612	107-198	9.1 - 45m (29.9 - 147.6ft)
4.16 - 6.96 : 1 zoom lens	105-613	107-199	12 - 80m (39.4 - 262.5ft)
6.92 - 10.36 : 1 zoom lens	109-235	109-358	12 - 80m (39.4 - 262.5ft)

Useful lens calculations

The following lens calculations may be useful:

$$\text{Throw ratio} = \frac{\text{Throw distance}}{\text{Screen width}}$$

$$\text{Throw ratio factor (TRF)} = \frac{\text{DMD width in pixels}}{\text{image width in pixels}} = \frac{1920}{\text{image width in pixels}}$$

Therefore:

$$\text{Screen width} = \frac{\text{Throw distance}}{\text{Throw ratio} \times \text{TRF}}$$

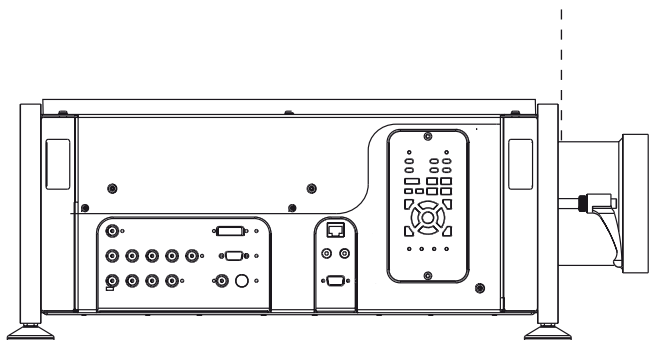
$$\text{Throw distance} = \text{Screen width} \times \text{Throw ratio} \times \text{TRF}$$

Lens extension

The throw distance calculated above is to the outer end of the lens. For each lens, the nominal distance between the front of the projector and the outer end of the lens (lens extension) will be as listed below.

	High Brightness/ Contrast		Lens extension (±2%)
0.67 : 1 fixed lens	105-607	107-195	204 mm (8.0 in)
1.12 : 1 fixed lens (3 - 15m)	105-608	105-608	268 mm (10.6 in)
1.12 : 1 fixed lens (1.2 - 2m)	105-609	105-609	268 mm (10.6 in)
1.16 - 1.49 : 1 zoom lens	109-236	109-359	226 mm (8.9 in)
1.39 - 1.87 : 1 zoom lens	105-610	107-196	194 mm (7.6 in)
1.87 - 2.56 : 1 zoom lens	105-611	107-197	159 mm (6.3 in)
2.56 - 4.16 : 1 zoom lens	105-612	107-198	145 mm (5.7 in)
4.16 - 6.96 : 1 zoom lens	105-613	107-199	129 mm (5.1 in)
6.92 - 10.36 : 1 zoom lens	109-235	109-358	179 mm (7.0 in)

*lens extension,
measured from front
of corner post*



Notes

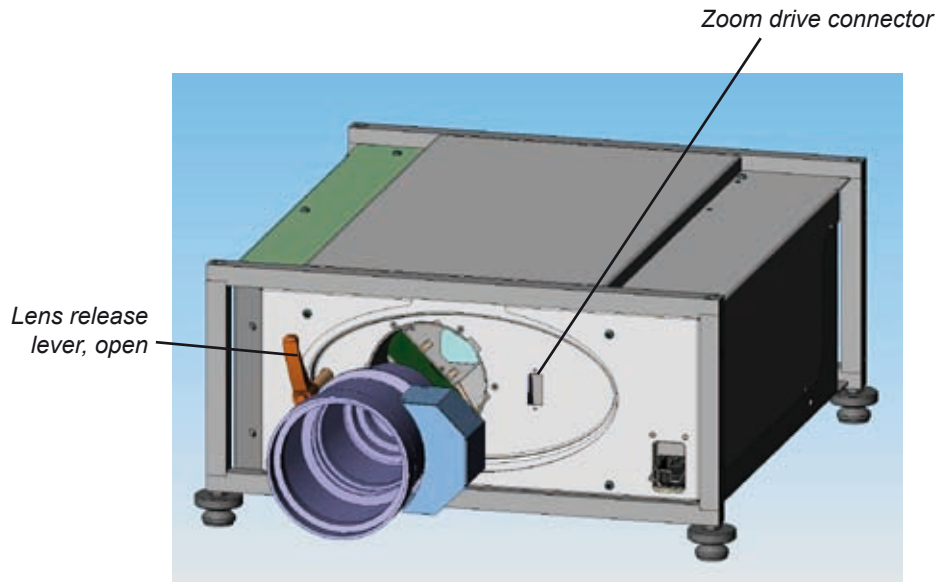


The Throw ratio for a particular lens is fixed, but assumes that the image fills the width of the DMD.

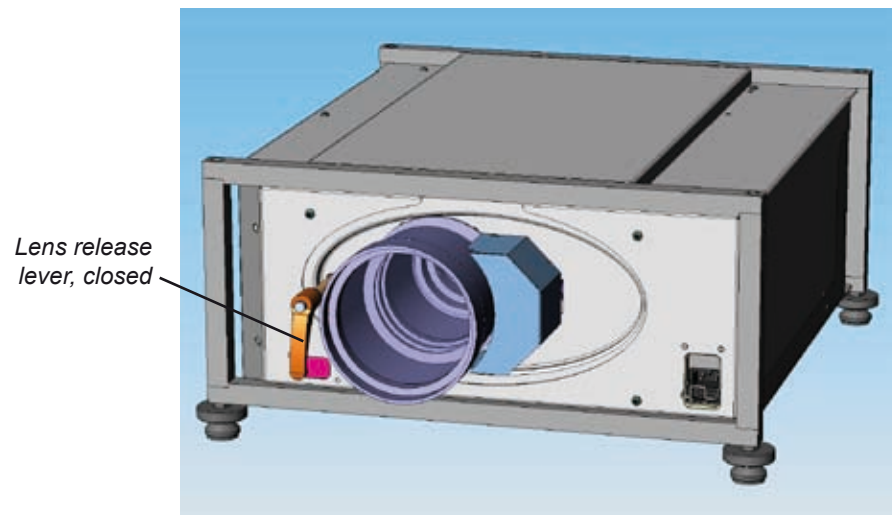
For images that do not fill the width of the DMD, the Throw ratio is effectively increased. To correct for this, a Throw Ratio Factor (TRF) is used.

Fitting the lens

- Turn the lens release lever anti-clockwise so that it is pointing upwards, to open the lock.
- Remove the rear lens cap from the lens.
- Insert the lens into the lens aperture, making sure that the plug on the drive mechanism engages with the socket on the front of the projector, and that the lens is pushed firmly into place.



- Turn the lens release lever clockwise to lock the lens in place. When the lock is fully closed, the lever should feel loose.



Notes



Each time a new lens is fitted to the projector, the calibration procedure must be carried out. See Setup menu, in Section 4. Controlling the projector.



Make sure the rear lens cap is removed, before fitting the lens.



Make sure the front lens cap is removed, before switching on the projector.



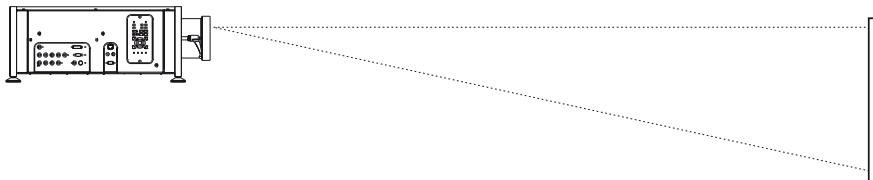
Be careful not to scratch the lens surfaces. If you do accidentally touch a lens, then clean the surface using a lens paper.



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

Shifting 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 to maintain a geometrically correct image.



- Any single adjustment outside the ranges specified below 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 diagrams to the right.

The maximum range available with no distortion is dependent on which lens is used. The tables below show the maximum range for images that fill the DMD. For images which do not use the full height or width, extra shift will be possible, up to the limit of the lens mount movement.

0.67 : 1 fixed lens

vertical (pixels)	horizontal (pixels)	vertical (vs DMD height)	horizontal (vs DMD width)
± 108	± 192	± 0.1H	± 0.1W

1.16 - 1.49 : 1 zoom lens

vertical (pixels)	horizontal (pixels)	vertical (vs DMD height)	horizontal (vs DMD width)
± 540	± 345	± 0.5H	± 0.18W

1.12 : 1 fixed lenses and all other zoom lenses

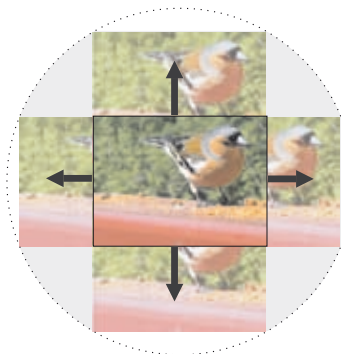
vertical (pixels)	horizontal (pixels)	vertical (vs DMD height)	horizontal (vs DMD width)
+ 756 - 540	± 345	+ 0.7H - 0.5H	± 0.18W

It is physically possible to shift the lens further than this, however there will be some vignetting of the image beyond the ranges specified above.

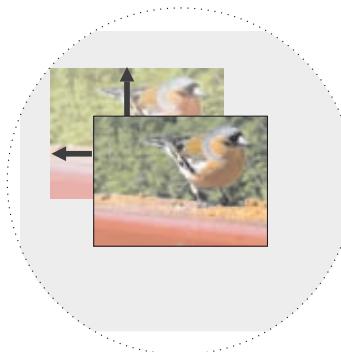
Notes

 For more information on using the Lens shift feature, see **section 4. Using the menus, Using the control keys.**

 If the lens is to be shifted in two directions combined, the maximum range is somewhat less, as can be seen below. (zoom lens shift shown).



full horizontal or vertical shift
without distortion



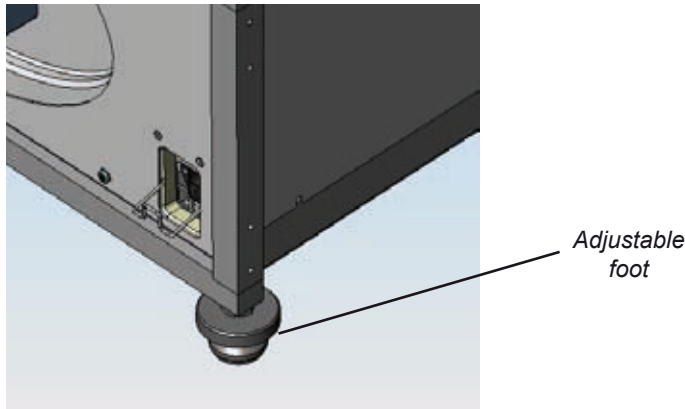
combined shift
is reduced

Mounting the projector

The projector is designed to be used on a flat surface, but the optional rigging frame will allow it to be suspended from a lighting truss or rigging. The four adjustable feet under the chassis allow the projector to be lowered onto a flat surface without any danger of hands being trapped between the bottom frame and the surface.

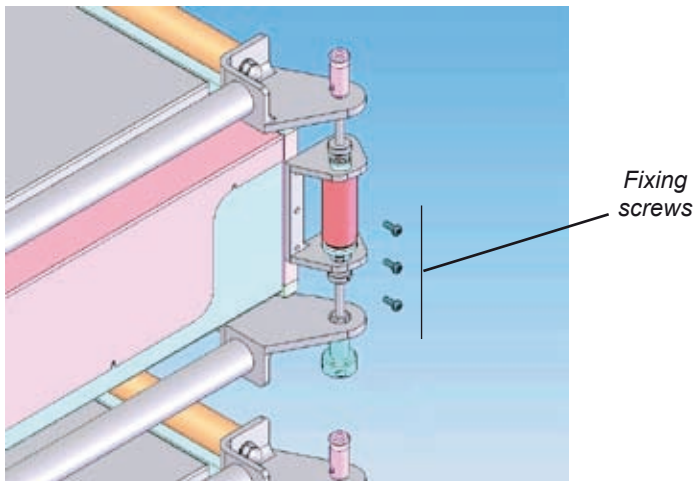
Chassis adjustment

If the projector is to be operated from a flat surface such as a projector table, then adjustment of projector level should be made by turning the four feet under the chassis.



Fitting the optional rigging frame

- Before fitting the rigging frame to the projector:
 - remove the four feet;
 - discard the bracket supplied for use with Titan 1080p-500/250 projectors;
 - make sure that all the frame adjusters are set midway.
- Secure the rigging frame to the projector using the screws supplied, as shown in the pictures below. Three screws secure each of the adjuster brackets to its corner post.



Notes

BEFORE INSTALLING THE PROJECTOR, READ ALL THE WARNINGS BELOW AND ALL THOSE IN IMPORTANT INFORMATION AT THE FRONT OF THIS MANUAL.

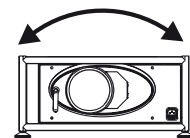
The projector weighs approximately 31 kg (68 lbs). Use safe handling techniques when lifting the projector.

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 (see specification for weights).

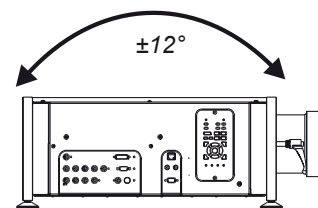
Backup safety chains or wires should always be used.

Do not tilt the projector more than $\pm 12^\circ$ in either direction when in use, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.

$\pm 12^\circ$



$\pm 12^\circ$

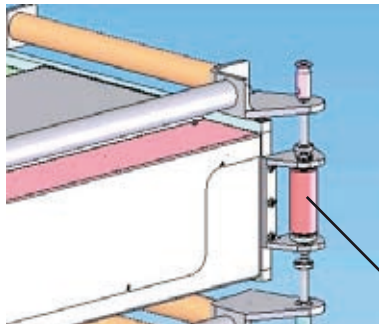
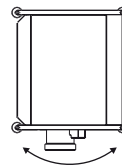
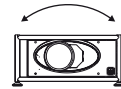
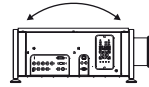


It may be possible to use the projector in other orientations, depending on lamp configuration. For more information, contact Digital Projection.

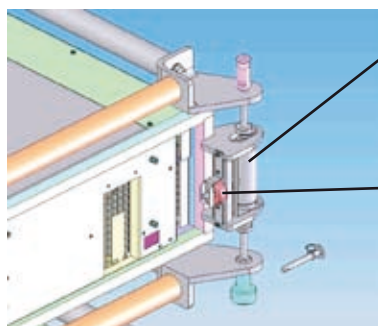
Adjusting the rigging frame

Coarse adjustment of projector level should be made by adjusting the length of the supporting wires or chains, or by adjusting the position of the truss or rigging. Once the initial coarse adjustment has been made, fine adjustment can be made by turning the frame adjusters on the rigging frame:

- To tilt the projector forwards and backwards (pitch adjustment), turn either the front pair or the rear pair of vertical adjusters, taking care to turn both adjusters by the same amount.
- To tilt the projector from side to side (roll adjustment), turn either the left pair or the right pair of vertical adjusters, taking care to turn both adjusters by the same amount.
- To rotate the projector around its vertical axis (yaw adjustment), turn the single horizontal adjuster at the rear.



Vertical adjusters



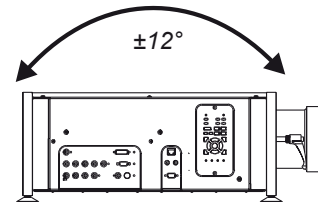
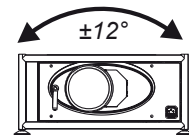
Horizontal adjuster

Notes

 Before suspending the projector, make sure that all the frame adjusters are set midway.

 Always make adjustments in pairs - never make a single adjustment - otherwise the projector frame could become distorted.

 Do not tilt the projector more than $\pm 12^\circ$ in either direction when in use, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.

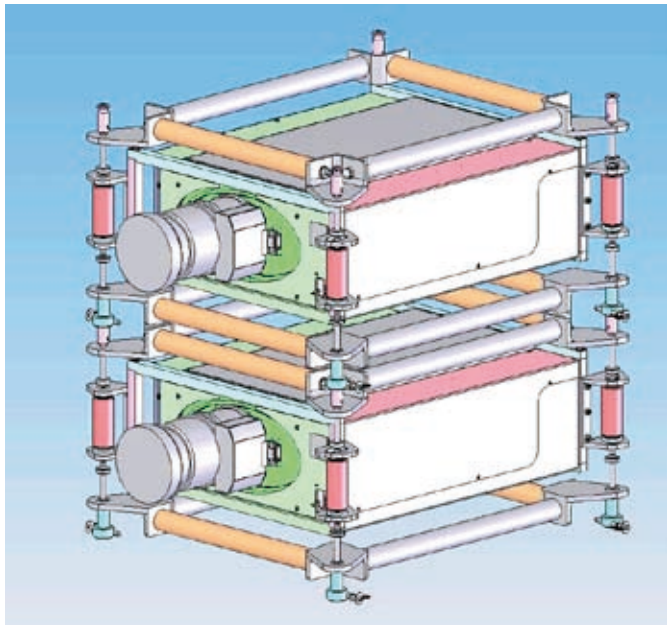
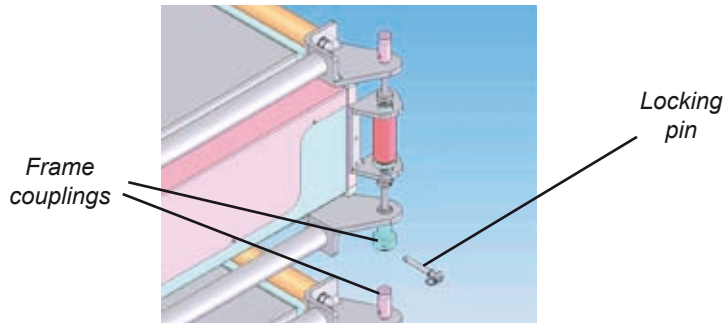


 It may be possible to use the projector in other orientations, depending on lamp configuration. For more information, contact Digital Projection.

Stacking projectors

The rigging frame is capable of supporting the weight of up to two other projectors, using the built-in frame couplings. The projectors can be stacked on top of each other, or suspended below each other.

- Carefully lower each projector down onto the top of the others, making sure that all four frame couplings engage fully.
- Fit a locking pin into each coupling. A ball in the end of the pin prevents the pin from falling out – to insert or remove a locking pin, press the button on the end of the pin to release the ball.

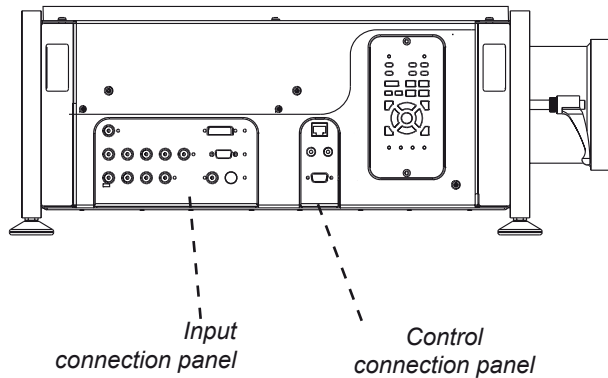


- Align the images from the projectors, following the instructions on the previous page and those in **section 3. Getting started, Adjusting the lens and Adjusting the projected image.**

Notes

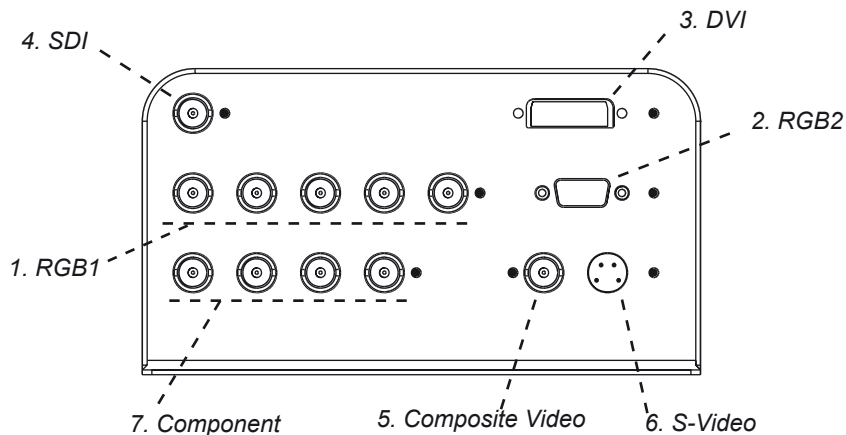
- ! **When stacking projectors, the stack **MUST** be vertical, to ensure that the stresses are distributed to all frame couplings.**
- ! **Make sure that the surface, ceiling or rigging that is to support the projector is capable of supporting the combined weight of all the projectors and lenses (see specification for weights).**
- ! **Do not place heavy objects on top of the projector chassis. Only the chassis corners and the rigging frame are capable of withstanding the weight of another projector.**
- ! **Do not try to stack more than 3 projectors.**
- ! **Separate backup safety chains or wires should always be used for each projector.**

Connecting the projector



Signal Inputs

The following inputs are available:



EDID handshaking on the DVI and RGB2 inputs

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

If not, then you should refer to the documentation supplied with the source to manually set the resolution to 1920 x 1080 or the nearest suitable setting. Switch off the source, connect to the projector, then switch the source back on again.

Notes

 For more information on selecting an input source, see **section 4. Overview, Using the control keys, and Using the menus.**

 SDI not present on earlier models

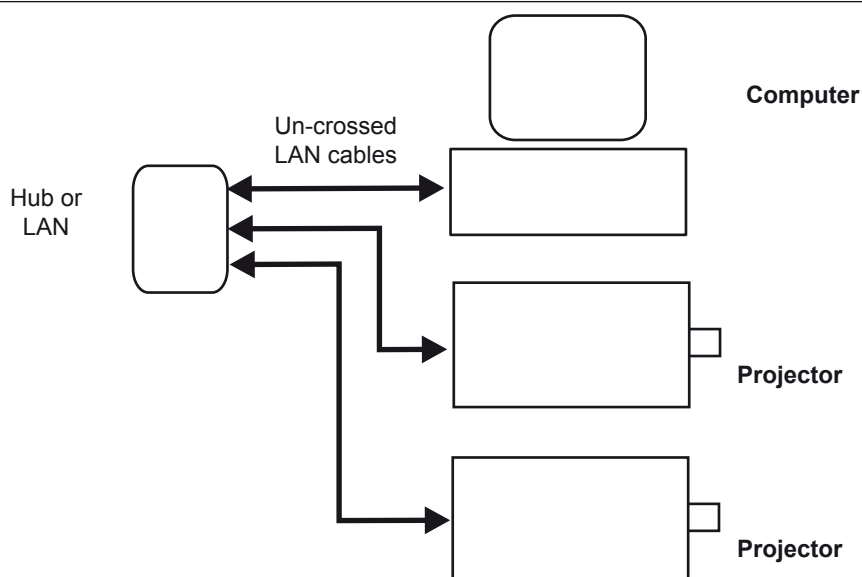
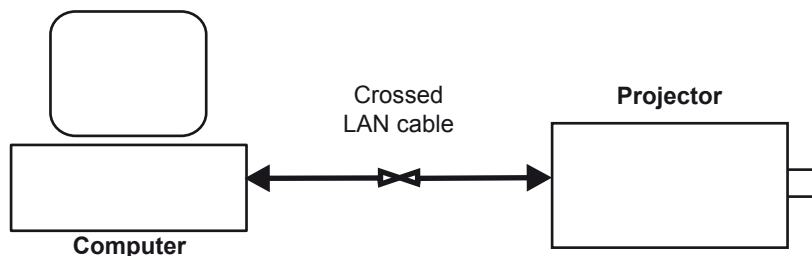
 For more information about pin connections and control codes see **section 7. Appendix.**

 For more information on input modes see **section 4. Overview.**

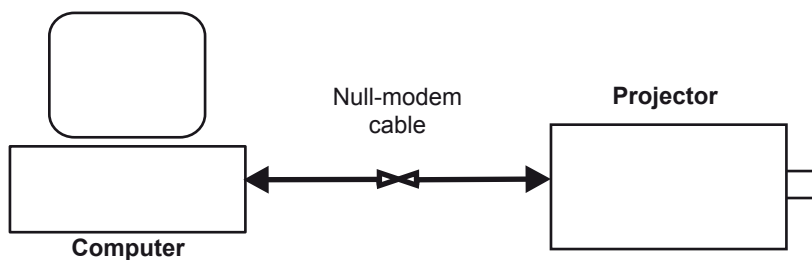
Control connection examples

LAN connection

All of the projector's features can be controlled via a LAN connection, using a standard internet browser package such as Internet Explorer.



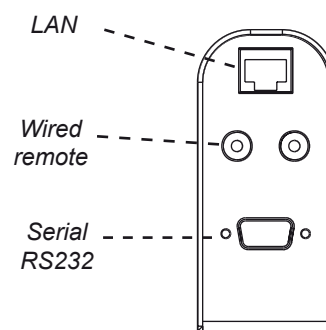
RS232 connection



Notes

 For more information about pin connections and control codes see **section 7. Appendix**.

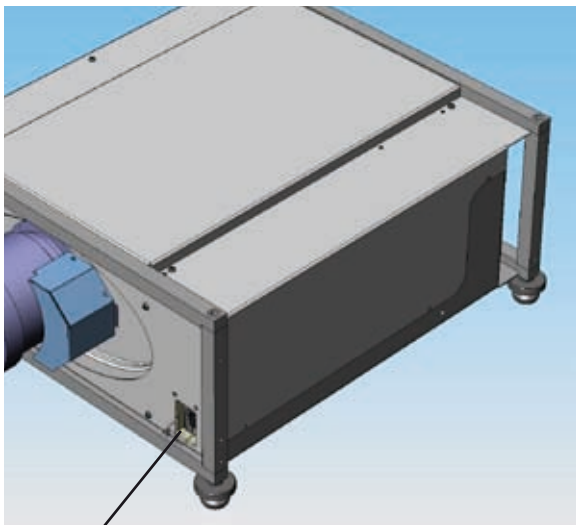
 For more information about using a browser to control the projector see **section 4. Using the menus**.



Power connection

When mains power is first applied, the projector will perform a self-test, then go into Standby mode.

The Power indicator on the control panel will show amber until the **POWER**  on the remote control or the keypad, is pressed for 3 seconds.



Power connection

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.

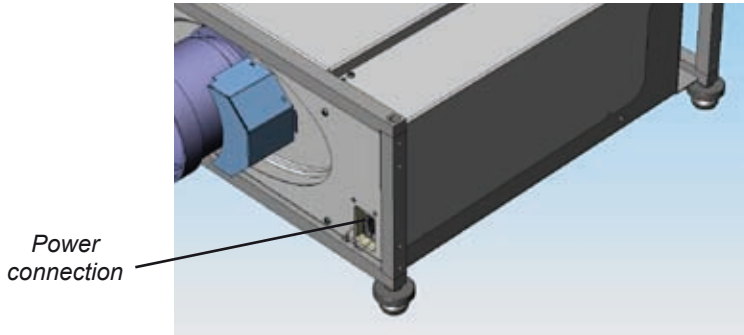
3. Getting Started

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Selecting an input or test pattern	3.2
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Geometry settings.....	3.4
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Switching the projector on

- Connect the power cable between the mains supply and the projector.



Wait until the self-test has completed and the power indicator on the control panel shows amber. The lamp will be off, the shutter closed, and the projector will be in STANDBY mode.

- Press POWER  on the remote control or the keypad, and hold for about 3 seconds to switch the projector ON. The power indicator on the control panel will show green, the lamp will light and the shutter will open.

Selecting an input or test pattern

Input

- Press  or  to change to the next input up or down the following list:

1. RGB1
2. RGB2
3. DVI
4. SDI
5. Composite Video
6. S-Video
7. Component

- Or press the numbered keys 1–7 to change directly to the input:



Test pattern

If you have no video source connected to the projector, then you can display a test pattern as follows:

- Press  on the remote control, to select a test pattern.

Notes



For more information about connecting the power cable, see **Power Connections**, in section 2. Installation.



For more detailed information about:

- using the control keys on the remote control or keypad,

- using the menus,

see the next section:

Controlling the projector.



SDI not present on earlier models

Adjusting the lens

Focus

- Press  followed by  and  to adjust the focus.

When adjustment is finished, press .

Zoom

- Press  followed by  and  to adjust the zoom.

When adjustment is finished, press .

Shift

- Press  followed by , ,  or  to shift the lens up, down, left or right.

When adjustment is finished, press .

Notes



Each time a new lens is fitted to the projector, the calibration procedure must be carried out. See Setup menu, in Section 4. Controlling the projector.



For more detailed information about:

- using the control keys on the remote control or keypad,

- using the menus,

see the next section:

Controlling the projector.



When any of the three Lens adjustment keys is pressed, the blue Transmit indicator on the remote control will light for 10 seconds:

- after 10 seconds, if no adjustment has been made, the indicator will go out and the Lens adjustment key must be pressed again to resume adjustment.

- to end the adjustment before 10 seconds has elapsed, press

the  key.

- all other adjustments will be locked out until the Lens adjustment is ended.

Adjusting the projected image

Picture settings

- Press a  key, followed by  and  to adjust these picture settings:

Brightness	 BRI
Contrast	 CON
Saturation	 SAT
Phase	 PHASE
Aspect ratio	 ASPECT

Geometry settings

- Press Keystone  KEYST
followed by  and  to adjust the keystone correction.
- Press Position  POS (for all inputs except DVI)
followed by , ,  and  to adjust the picture position, for images smaller than the DMD.

Switching the projector off

- Press POWER  on the remote control or keypad, and hold for 3 seconds, to switch the projector OFF.

Notes



The **Saturation** control is available for Composite, S-Video and Component inputs only.



The **Phase** control is available for RGB inputs only.



For more detailed information about:

- using the control keys on the remote control or keypad,

- using the menus,

see the next section:

Controlling the projector.



For all adjustments that require more than one key to be pressed:

- after 10 seconds, if no adjustment has been made, the indicator will go out and the adjustment key must be pressed again.

- to end the adjustment before 10 seconds has elapsed, press a different adjustment key, or press the Exit key.



Always allow the lamp to cool for 5 minutes before:

- disconnecting the power
- moving the projector
- changing the lamp

4. Controlling the projector

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Overview

Controlling the projector

The projector can be controlled from:

- the remote control
- the keypad
- the RS232 input
- the Ethernet input

For more information about controlling the projector using the RS232 and Ethernet inputs, see **Remote communications protocol** in **section 7. Appendix**.

For information about how to connect the projector, see **Connecting the projector** in **section 2. Installation**, and **Connections** in **section 7. Appendix**.

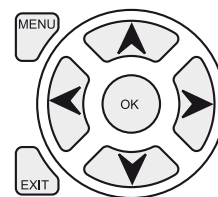
- Many features are controlled from the menus using the menu navigation keys on the remote control or keypad.

For more information about using the menus, see later in this section, **Using the menus**.

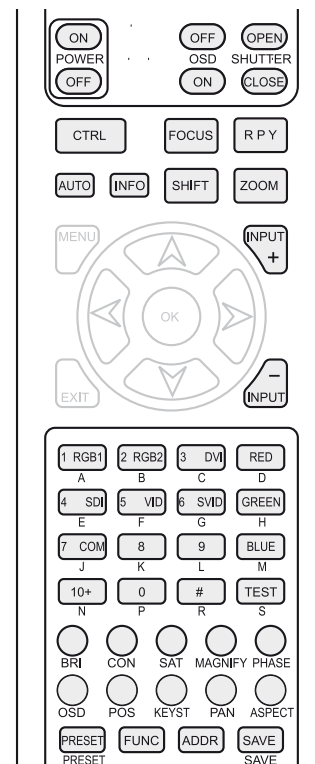
- Some of the menu features, for example brightness, contrast and input preset operations, can be accessed directly using the control keys at the bottom of the remote control.
- Other features, eg zoom and focus, are controlled using the control keys at the top of the remote control and keypad.

For more information about using the control keys, see later in this section, **Using the control keys**.

Notes



Menu navigation keys



Control keys

Input modes and settings

Input mode detection

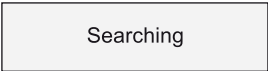
The projector can automatically detect the following parameters from the incoming video signal:

- line frequency
- frame rate
- interlace / progressive

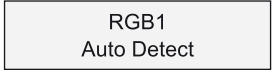
From these parameters the projector can determine input mode, for example:

<i>input source</i>	<i>horizontal</i>	<i>vertical</i>	<i>mode</i>
• composite	15.73KHz	60.0Hz	= NTSC
• RGB1	31.51KHz	60.0Hz	= SDTV 480p
• DVI	64.02KHz	60.0Hz	= SXGA 60

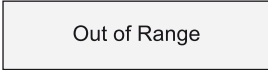
When you select a new input source, the green LED near the input connector will flash, and the searching message will be displayed.



When the input mode has been detected, the LED will show continuously and the auto detect message will be displayed, for example:

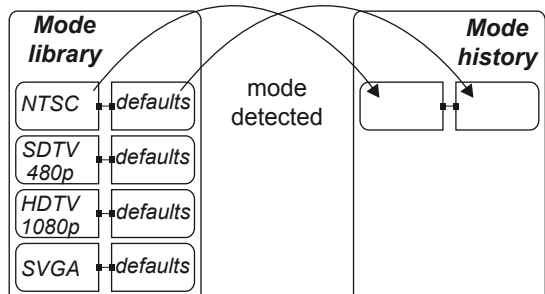


If the input mode cannot be detected, the LED will continue to flash, to show that the input is still selected. However, the following message will be displayed:



Mode library and mode history

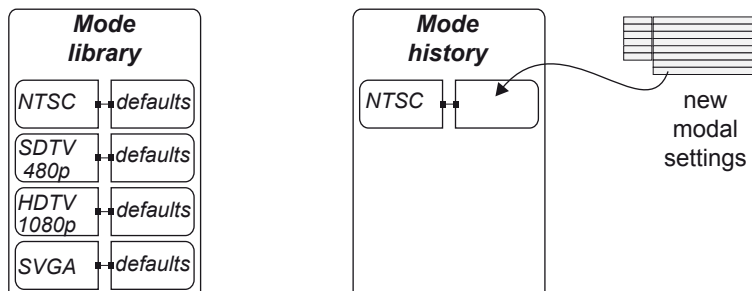
Once an input mode has been successfully determined for the first time, a set of default modal settings (picture, geometry and colour), will be copied from the **mode library** to the **mode history**.



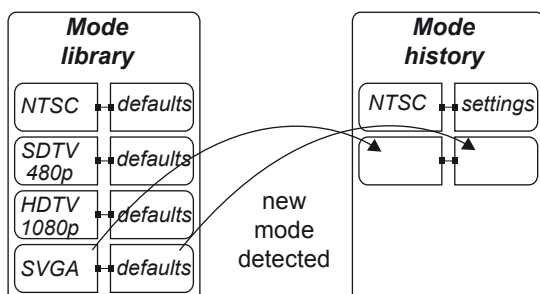
Notes

 For a full list of supported input modes, see **Input modes supported**, in **section 7. Appendix**.

Any subsequent changes that you make to the modal settings will be saved in the mode history, with the input mode.



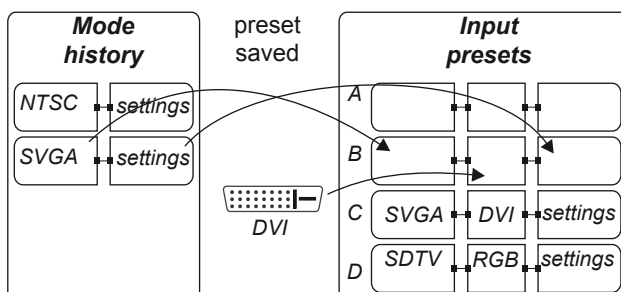
If a new signal is detected, the mode history for the previous signal will be saved in the mode history, and the new mode added, along with a new set of default settings. Thus the projector builds up a history of input modes, and the required settings for each mode, depending on actual usage.



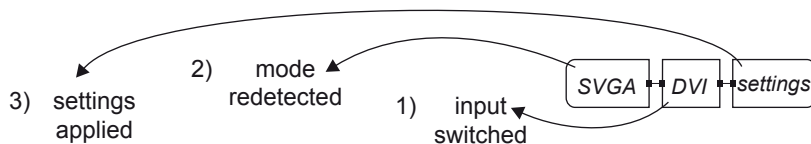
Input presets

It may be the case that you need to save more than one set of modal settings for the same input mode. For example you may have more than one video player or a selection of films with different characteristics.

In that case, the current input source and modal settings can be saved to any one of 16 **input presets**, for recall when the same input source is used again.



When you recall a preset, the projector switches to the saved input source, and redetects the input mode before applying the saved modal settings.



Notes

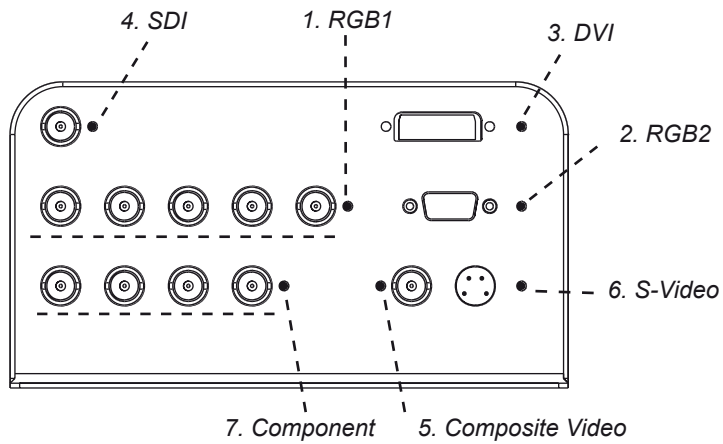
In normal use, there should be adequate memory to record all likely modal settings in the mode history.

However, in exceptional circumstances, the least used settings will be deleted, to allow a new mode to be added.

A preset can be applied only to the same mode for which it was created. If the detected input mode does not match, then settings from the mode history or mode library will be applied.

Indicators

Input status indicators



The indicator next to each input connector on the input panel will light as follows:

off = input not selected

green = input selected, signal detected and in range

flashing green = input selected, but signal **not** detected or out of range

Notes

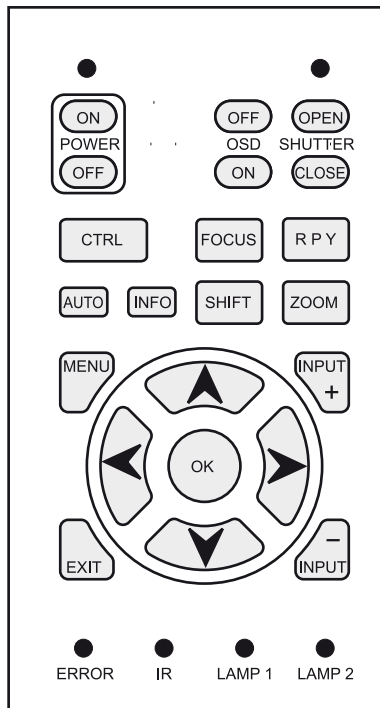
 There are more indicators on the Control panel, and these are described on the next page.

 SDI not present on earlier models

The control panel

Keypad layout

The controls on the keypad are identical to those at the top of the remote control, and are described on the following pages.



Notes



Many features are controlled from the menus using the **menu navigation keys** on the remote control or keypad.

For more information about using the menus, see later in this section, **Using the menus**.



Some of the menu features, for example brightness, contrast and input preset operations, can be accessed directly using the **control keys** at the bottom of the remote control.

Other features, eg zoom and focus, are controlled using the **control keys** at the top of the remote control and keypad.

For more information about using the control keys, see later in this section, **Using the control keys**.

Projector status indicators

The indicators on the control panel are as follows:

Power off = NO POWER

green = normal RUNNING mode amber = STANDBY mode

Shutter amber = CLOSED green = OPEN

Error off = NO ERROR

flashing = ERROR (temperature) steady = ERROR (voltage)

IR blue flash = Remote control command received

Lamp 1 off = OFF

flashing red = LAMP ERROR green = ON (100%) amber = (80 - 99%)

flashing green = LAMP WARM-UP flashing amber = COOL-DOWN

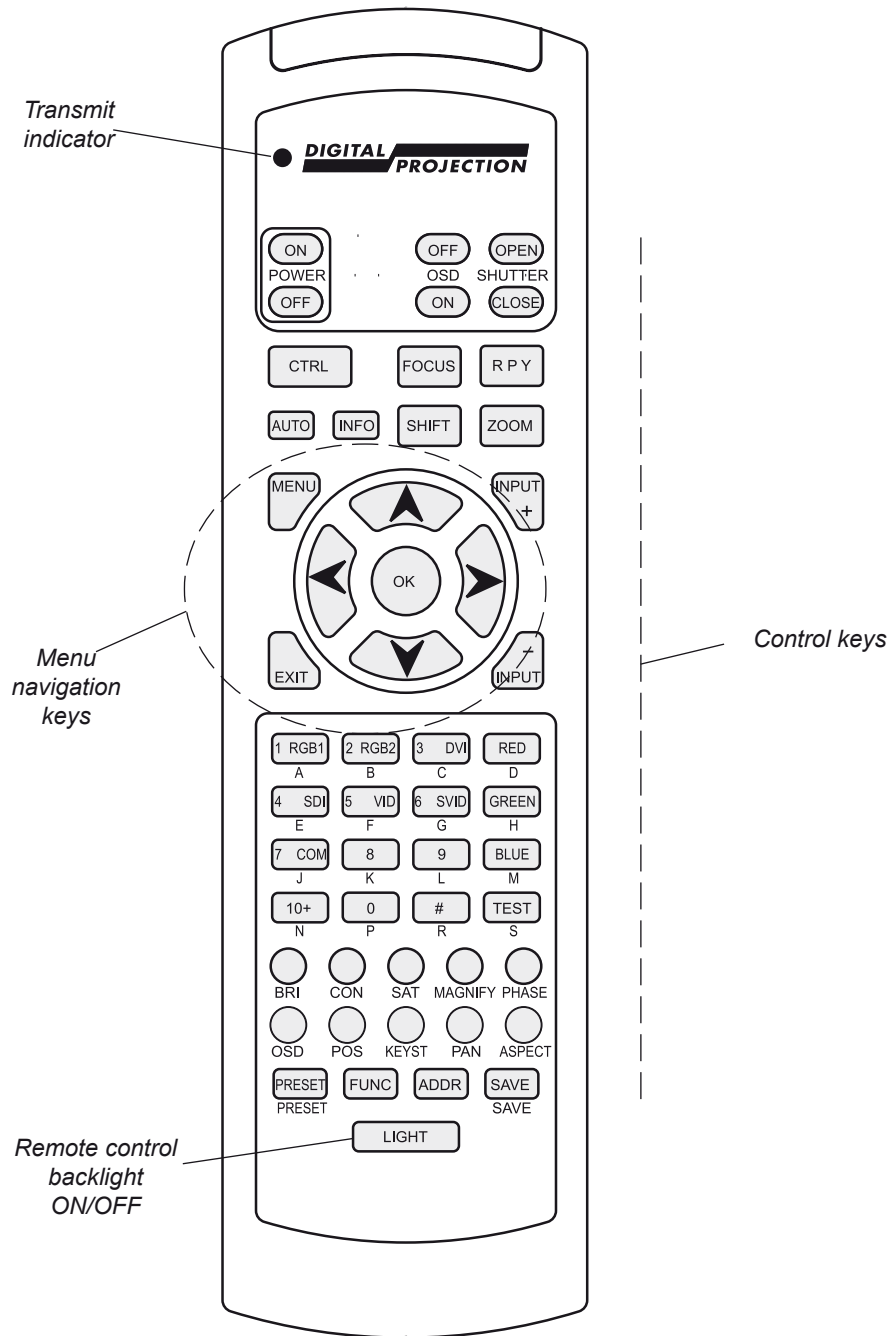
Lamp 2 off = OFF

flashing red = LAMP ERROR green = ON (100%) amber = (80 - 99%)

flashing green = LAMP WARM-UP flashing amber = COOL-DOWN

The remote control

Layout



Notes

Many features are controlled from the menus using the **menu navigation keys** on the remote control or keypad.

For more information about using the menus, see later in this section, **Using the menus**.

Some of the menu features, for example brightness, contrast and input preset operations, can be accessed directly using the **control keys** at the bottom of the remote control.

Other features, eg zoom and focus, are controlled using the **control keys** at the top of the remote control and keypad.

For more information about using the control keys, see later in this section, **Using the control keys**.

The following keys are **NOT** used on this projector:

CTRL
R P Y
FUNC

10+ (but N is used)
(but R is used)

Note that plugging in the remote control cable will disable the infra-red.

Timeout

There is a 10 second timeout for the three Lens adjustment keys (see note on next page).

There is a separate, adjustable timeout for the On Screen Menus (see **On Screen Display**, in **Setup Menu**, later in this section).

Using the control keys

Power

- Press POWER  and hold for 3 seconds, to switch the projector ON.
- Press POWER  and hold for 3 seconds, to switch the projector OFF.

Shutter

- Press SHUTTER  to OPEN the shutter.
- Press SHUTTER  to CLOSE the shutter.

On-Screen-Display

- Press OSD  to switch the On-Screen-Display OFF.
This includes ALL menus, controls and on-screen messages.
- Press OSD  to switch the On-Screen-Display ON.

Focus

- Press  followed by  and  to adjust the focus.
When adjustment is finished, press .

Zoom

- Press  followed by  and  to adjust the zoom.
When adjustment is finished, press .

Shift

- Press  followed by , ,  or  to shift the lens up, down, left or right.
When adjustment is finished, press .

Notes



Closing the shutter produces a better black than simply removing the signal, as the light source will be completely blocked by the shutter blade.



When the OSD is OFF:

- all menu navigation keys are disabled.

- keys such as  **BRI** (brightness) will still function, but the slider bars will not be visible on screen.



When any of the three Lens adjustment keys is pressed, the blue Transmit indicator on the remote control will light for 10 seconds:

- after 10 seconds, if no adjustment has been made, the indicator will go out and the Lens adjustment key must be pressed again to resume adjustment.

- to end the adjustment before 10 seconds has elapsed, press

the  key.

- all other adjustments will be locked out until the Lens adjustment is ended.



For more information about the amount of lens shift available, see **section 2. Installation**.

Auto-detect input mode

- Press  to force the projector to re-detect the input mode (see **Input modes and settings**, earlier in this section).

Source information

- Press  to display the source information screen.

Input

- Press  or  to change to the next input up or down the following list:

1. RGB1
2. RGB2
3. DVI
4. SDI
5. Composite Video
6. S-Video
7. Component

- Or press the numbered keys 1–7 to change directly to the input:



Notes



*For more information about input mode detection, see earlier in this section, **Input modes and settings**.*



SDI not present on earlier models

Input Presets

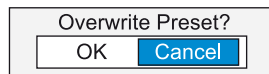
Recall

- To recall a set of modal and lens settings that have been saved, press and hold **PRESET**, whilst pressing the lettered key **A – S**.
- The projector will switch to the saved input source, and redetect the input mode before applying the saved modal and lens settings.

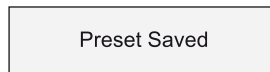
Save

- To save the current input source, modal and lens settings, press and hold **SAVE**, whilst pressing the lettered key **A – S**.

If this Preset has been used before, and the Input source has been changed, then the following message will be displayed.



- Press **◀** and **▶** to select either OK or Cancel.
- Press **OK** to confirm your selection.
- The settings will be saved to the selected preset, and the following message will be displayed.



Notes



*For more information about input modes and input presets, see earlier in this section, **Input modes and settings**.*

*See also **Input menu**, later in this section.*



A preset can be applied only to the same mode for which it was created. If the detected input mode does not match, then settings from the mode history or mode library will be applied.

*For more information about input modes, see **Input modes and settings**, earlier in this section.*



The lens settings, ie Focus position, Zoom position and Shift, are included only for the first ten presets.

Red, Green and Blue

- Press **RED**, **GREEN** or **BLUE** to switch the red, green or blue components OFF or ON.

Test pattern

- Press **TEST** to select a test pattern.

Picture settings

- Press a  key, followed by **◀** and **▶** to adjust these picture settings:

Brightness	 BRI
Contrast	 CON
Saturation	 SAT
Phase	 PHASE
Aspect ratio	 ASPECT

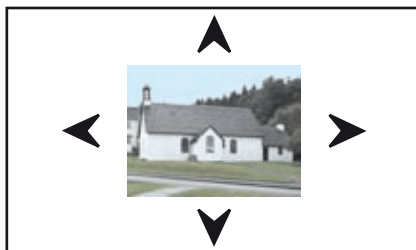
Geometry settings

Keystone adjustment is used to correct for distortion caused by the projector being mounted higher or lower than the screen.

- Press Keystone  **KEYST**, followed by **◀** and **▶** to adjust the keystone correction:



- Press Position  **POS**, followed by **◀**, **▶**, **▲** and **▼** to adjust the picture position, for images smaller than the DMD:



Notes

-  The red, green and blue keys are disabled when the OSD is switched OFF.
-  For more information about test patterns, see Setup menu, later in this section.
-  The **Saturation** control is available for Composite, S-Video and Component inputs only.
-  The **Phase** control is available for RGB inputs only.
-  For all adjustments on this page that require more than one key to be pressed:
 - after 10 seconds, if no adjustment has been made, the  key must be pressed again to resume adjustment.
 - to end the adjustment before 10 seconds has elapsed, press a different adjustment key, or press the  key.
-  When the OSD is OFF:
 - the  keys will still function, but the controls will not be visible on screen.

Magnify and pan

- Press Magnify  MAGNIFY

followed by  and  to adjust the size of the picture.



- Press Pan  PAN

followed by , ,  and  to adjust the position of the magnified image.



On-screen-display size

- Press Size  SIZE

to switch the size of the OSD between large and small.

Remote control address

The projector and the remote control need to be set to matching addresses. Read the note to the right on this page, and follow the instructions in the order shown below:

- Set the projector address as shown in **Setup menu**, later in this section.
- Set the remote control address:

- Press and hold 

whilst pressing two numbered keys  0 – 9

to set the remote control address to any number between 00 and 99.
(leading zeros must be used for numbers less than 10)

Remote control backlight

- Press  to switch the backlight on and off.

Notes



The magnify feature utilises a digital zoom. Used with the pan control, this can be used to:

- enlarge a section of the image
- enable the use of multiple projectors to construct a large image from tiles.



The pan control is available only when the image has been magnified.



If the OSD moves off screen due to a change in image size, then pressing the size key will restore its readability.



When fresh batteries are inserted in the remote control it will default to address 00. Remote control 00 is a **master control**, able to control all projectors.

If two or more projectors are set to the same address, they can be controlled from one remote control, provided they are connected by cable or in range of the infra red.

Using the menus

Navigating menus and submenus

When the menus are in use and the OSD is ON, the **top level menu headings** are always visible to the left of the screen.

Input	
Picture	
Geometry	
Colour	
Setup	
Information	

Each **menu** item can lead to a number of **submenus**, which are displayed in the column to the right. The ► symbol indicates that a submenu is available.

Each **submenu** can lead to further submenus, up to a maximum of three levels.

- To display the menus, press  on the remote control or the keypad.
- The menus will always open at the same point they were last viewed. The example below shows the first menu display following power on – the item that is currently selected (the Input menu) is highlighted in blue.

Input	1. RGB1
Picture	2. RGB2
Geometry	3. DVI
Colour	4. SDI
Setup	5. Composite Video ◀
Information	6. S-Video
	7. Component
	Presets ▶

- To select a menu, press ▲ and ▼, for example the Setup menu:

Input	Projector ▶
Picture	Global Colour Settings ▶
Geometry	Lamp ▶
Colour	On Screen Display ▶
Setup	Password ▶
Information	Communication ▶
	Restore Defaults ▶

Notes

 Some menu controls can be accessed directly using the **control keys** (see earlier in this section).

 When the OSD is OFF, all menu navigation keys will be disabled.

When the OSD is switched back ON, the menus will remain OFF

until the  key is pressed again. The menus will then reopen at the same point they were last viewed.

 If a menu is opened, and no other key is pressed within the period set in the **OSD Timeout** menu, then the menus will

disappear. When the  key is pressed again, the menus will reopen at the same point they were last viewed.

(see **On Screen Display**, in **Setup Menu**, later in this section).)



Main menu: Input



SDI not present on earlier models



Main menu: Setup

- Press  to open the menu. The blue highlight moves to the first item in the menu, which may be submenu, for example the Projector Setup submenu.

Input	Projector	
Picture	Global Colourimetry	
Geometry	Lamp	
Colour	On Screen Display	
Setup	Password	
Information	Communication	
	Network	
	Restore Defaults	
	Centre Lens	

- To select a submenu, press  and , for example the Lamp submenu. Press  to open the submenu. The submenu opens, with the title at the top.

Input	LAMP	
Picture	Current Setting [100%] Lamp1	
Geometry	Change Lamp Setting	
Colour		
Setup		
Information		

- To close the submenu and return to the previous level, press .

Input	Projector	
Picture	Global Colourimetry	
Geometry	Lamp	
Colour	On Screen Display	
Setup	Password	
Information	Communication	
	Network	
	Restore Defaults	

- There may be up to three levels of submenu, so to return to the top level, you may have to press  up to three times.

- To close the menu display completely, press .

Notes



Setup menu



Setup menu
Lamp



Setup menu

Menu controls

Some menus have controls, as shown in the examples below.



Notes

Some menus items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.

Input	Brightness	0	-		+
Picture	Contrast	0	-		+
Geometry	Saturation	127	-		+
Colour	Hue	127	-		+
Setup	Gamma			parametric	
Information	Parametric Gamma	2.2	-		+
	Phase		-		+
	Aspect Ratio				
	Sharpness	0	-		+

Slider bar

The highlighted slider bar shows which control is active currently.

To adjust the slider press ◀ and ▶.

Parameter selection

To select from a number of parameters, (shown one at a time to the right), press ◀ and ▶.

These two items are greyed out and the values are blank, showing that they are not available, due to the effect of settings made in other menus, or due to the type of input signal.

Input	1. RGB1
Picture	2. RGB2
Geometry	3. DVI
Colour	4. SDI
Setup	5. Composite Video ◀
Information	6. S-Video
	7. Component
	Presets ▶

Parameter list

To select from a list of parameters, press ▲ and ▼.

Input menu



To return to the **main menu**, press  up to three times.

From the main menu:

- Press  and  until Input is highlighted.

Press  to open the Input menu. The blue highlight moves to the first item in the menu. The  symbol shows which input is currently selected.

Input	1. RGB1	
Picture	2. RGB2	
Geometry	3. DVI	
Colour	4. SDI	
Setup	5. Composite Video	
Information	6. S-Video	
	7. Component	
	Presets	

Input Source

- Press  and  to select from:
 1. RGB1
 2. RGB2
 3. DVI
 4. SDI
 5. Composite Video
 6. S-Video
 7. Component
- Press  to confirm your selection.

Notes



Some menu controls can be accessed directly using the **control keys** (see earlier in this section).



When using the menus, press **OSD**  or  to hide or reveal the On-Screen-Display.



Input Menu



SDI not present on earlier models



For more information about the input connections, see **section 2. Installation**, and **section 7. Appendix**.



When an input has been selected, the projector will automatically detect input mode settings such as line rate and resolution etc.

To force the projector to re-detect the input mode settings, press .

Input menu continued**Presets**

Sixteen sets of parameters can be saved and recalled (A – S). The parameters saved for each **Preset** are:

- all settings from the Picture menu,
- all settings from the Input menu (1 – 7)
- all settings from the Geometry menu, except Keystone
- all settings from the Colour menu, except Global
- all lens position, focus and zoom settings

- Press ▲ and ▼ to select Presets.

Press ► to open the Presets submenu.

Input	PRESETS
Picture	Recall Preset ►
Geometry	Save Preset ►
Colour	
Setup	
Information	

Recall Presets

- Press ▲ and ▼ to select Recall Preset.

Press ► to open the Recall Presets A ~ H submenu. Any presets that have been saved are indicated by their description, for example D: in this example.

Input	RECALL PRESET A ~ H
Picture	A:
Geometry	B:
Colour	C:
Setup	D: VID PAL50/4.43 Fill
Information	E:
	F:
	G:
	H:
	Recall Preset J ~ S ►

- To recall a set of parameters that has been saved, press ▲ and ▼ to select one of the Presets.

For Presets J to S, select Recall Preset J ~ S then press ► to open the J~S submenu. Press ▲ and ▼ to select the Preset.

- Press  to confirm your selection.

The Preset parameters will be loaded.

Notes

Some menu controls can be accessed directly using the **control keys** (see earlier in this section).



For more information about input modes and input presets, see earlier in this section, **Input modes and settings**.



Input Menu
Presets



Input Menu
Presets
Recall Presets A ~ H

Input menu continued

Save Presets

- Press ▲ and ▼ to select Save Preset.
Press ➤ to open the Save Presets A ~ H submenu.

Input	SAVE PRESET A ~ H
Picture	Save Preset A
Geometry	Save Preset B
Colour	Save Preset C
Setup	Save Preset D
Information	Save Preset E
	Save Preset F
	Save Preset G
	Save Preset H
	Save Preset J ~ S ➤

- To save the current set of parameters, press ▲ and ▼ to select one of the Presets.

For Presets J to S, select Save Preset J ~ S then press ➤ to open the J~S submenu. Press ▲ and ▼ to select the Preset.

Press  to confirm your selection.

If this Preset has been used before, but only if the Input source has been changed, then the following message will be displayed.

Overwrite Preset?

OK Cancel

Press ◀ and ▶ to select either OK or Cancel.

Press  to confirm your selection.

The parameters will be saved to the selected preset, and the following message will be displayed.

Preset Saved

Notes

 Some menu controls can be accessed directly using the control keys (see earlier in this section).



Input Menu
Presets
Save Presets A ~ H

Input menu continued

Delete Presets

- Press ▲ and ▼ to select Delete Preset.
Press ► to open the Delete Presets A ~ H submenu.

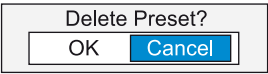
Input	DELETE PRESET A ~ H
Picture	A:
Geometry	B:
Colour	C:
Setup	D: VID PAL50/4.43 Fill
Information	E:
	F:
	G:
	H:
	Delete Preset J ~ S ►

- To delete a saved set of parameters, press ▲ and ▼ to select one of the Presets.

For Presets J to S, select Delete Preset J ~ S then press ► to open the J~S submenu. Press ▲ and ▼ to select the Preset.

Press  to confirm your selection.

The following message will be displayed.



Press ◀ and ▶ to select either OK or Cancel.

Press  to confirm your selection.

The preset will be deleted, and the following message will be displayed.



Notes



Input Menu
Presets
Delete Presets A ~ H

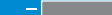
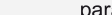
Picture menu

 To return to the **main menu**, press  up to three times.

From the main menu:

- Press  and  until Picture is highlighted.

Press  to open the Picture menu. The blue highlight moves to the first item in the menu.

Input	Brightness	0	-		+
Picture	Contrast	0	-		+
Geometry	Saturation	127	-		+
Colour	Hue	127	-		+
Setup	Gamma	parametric			
Information	Parametric Gamma	2.2	-		+
	Phase	127	-		+
	Aspect Ratio	1.85:1 (Flat)			
	Sharpness	0	-		+

Brightness

- Press  and  to select Brightness.
- Press  and  to adjust the slider (-128 to +127).

Contrast

- Press  and  to select Contrast.
- Press  and  to adjust the slider (-128 to +127).

Saturation

Adjusts the saturation at white peak levels.

- Press  and  to select Saturation.
- Press  and  to adjust the slider (0 to 255).

Hue

Adjusts the color balance from green to blue, using the red level as a reference.

- Press  and  to select Hue.
- Press  and  to adjust the slider (0 to 255).

Notes

 Some menu controls can be accessed directly using the **control keys** (see earlier in this section).

 When using the menus, press **OSD**  or  to hide or reveal the On-Screen-Display.



Picture Menu

 Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.

 The **Saturation** slider is available for Composite, S-Video and Component inputs only.

 The **Hue** slider is available for NTSC inputs only.

Picture menu continued**Gamma Correction**

Video recordings are often supplied with a gamma adjustment applied. The projector's gamma adjustment can be used to correct for this.

- Press ▲ and ▼ to select Gamma.

Press ◀ and ▶ to select from:

Parametric	Enables the gamma slider
User download	Applies the gamma settings made externally using the DP Userware on a personal computer. (default gamma of 2.2)
2.2 Limited DVI	Expands DVI signal to use full dynamic range with gamma 2.2
2.4 Limited DVI	Expands DVI signal to use full dynamic range with gamma 2.4
Graphics	Enhanced highlights and contrast
NTSC	NTSC colour space, with a gamma of 2.2
PAL	PAL colour space, with a gamma of 2.2
Linear	gamma of 1.0
Punch	Enhanced brightness and increased colour saturation for high ambient environments.

Parametric Gamma

- Press ▲ and ▼ to select Parametric Gamma.

Press ◀ and ▶ to adjust the slider (1.0 to 3.0 in 0.1 steps).

Phase

Phase should be set automatically by the projector, but can be adjusted manually to correct for shimmering or poor quality definition on, for example, fine text.

- Press ▲ and ▼ to select Phase.

Press ◀ and ▶ to adjust the slider (0 to 31).

Notes

For more information about User gamma settings, see **section 5. DP Userware**.



Parametric Gamma adjustment is available only when **Parametric** is selected in Gamma selection, above.



Phase adjustment can be found in both the **Picture** and **Geometry** menus, and is available for RGB1 and RGB2 inputs only.

Picture menu continued

Aspect Ratio

- Press ▲ and ▼ to select Aspect Ratio.

Press ◀ and ▶ to select from:

Fill *This will best fit the incoming source to fill either the height or width without changing the aspect ratio of the source.*

User Aspect

1.33:1 (4:3)

1.6:1 (16:10)

1.78:1 (16:9)

2.35:1 (Scope)

1.66:1 (Vista)

1.85 (Flat)

Theaterscope *Use with the TheaterScope Anamorphic System only. The 2.35:1 source image is displayed using the full area of the 16:9 DMD. This is then stretched to 2.35:1 by the lens.*

Native *The image will be displayed pixel for pixel. The image will be centred, with a black border if smaller than 1920 x 1080 or cropped if larger.*

Sharpness

- Press ▲ and ▼ to select Sharpness.

Press ◀ and ▶ to adjust the slider.

Notes



Aspect Ratio selection can be found in both the Picture and Geometry menus.



When **User Aspect** is selected, the Aspect Ratio settings are taken from the **User H Aspect** and **V Aspect** settings made in the **Geometry** menu.



The **Sharpness** slider is available for Composite, S-Video and Component SD inputs only.

Geometry menu

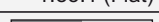


To return to the **main menu**, press  up to three times.

From the main menu:

- Press  and  until Geometry is highlighted.

Press  to open the Geometry menu. The blue highlight moves to the first item in the menu.

Input	H Position	128	-		+
Picture	V Position	64	-		+
Geometry	Aspect Ratio	1.85:1 (Flat)			
Colour	User H Aspect	500	-		+
Setup	User V Aspect	500	-		+
Information	Keystone	0	-		+
	Phase	127	-		+
	Resolution				
	Blanking				

Horizontal Position

- Press  and  to select H Position.

Press  and  to adjust the slider.

Vertical Position

- Press  and  to select V Position.

Press  and  to adjust the slider.

Aspect Ratio

- Press  and  to select from:

Fill *This will best fit the incoming source to fill either the height or width without changing the aspect ratio of the source.*

User Aspect

1.33:1 (4:3)

1.6:1 (16:10)

1.78:1 (16:9)

2.35:1 (Scope)

1.66:1 (Vista)

1.85 (Flat)

Theaterscope *Use with the TheaterScope Anamorphic System only. The 2.35:1 source image is displayed using the full area of the 16:9 DMD. This is then stretched to 2.35:1 by the lens.*

Native *The image will be displayed pixel for pixel. The image will be centred, with a black border if smaller than native resolution or cropped if larger.*

Notes



Some menu controls can be accessed directly using the **control keys** (see earlier in this section).



When using the menus, press **OSD**  or  to hide or reveal the On-Screen-Display.



Geometry Menu



Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.



Aspect Ratio selection can be found in both the Picture and Geometry menus.



When **User Aspect** is selected, the Aspect Ratio settings are taken from the **User H Aspect** and **V Aspect** settings (see next page).

Geometry menu continued

User Horizontal Aspect Ratio

- Press ▲ and ▼ to select User H Aspect.
- Press ◀ and ▶ to adjust the slider (internal number – adjust to fit).

User Vertical Aspect Ratio

- Press ▲ and ▼ to select User V Aspect.
- Press ◀ and ▶ to adjust the slider (internal number – adjust to fit).

Keystone

Used to correct for distortion caused by the projector being mounted higher or lower than the screen.

- Press ▲ and ▼ to select Keystone.
- Press ◀ and ▶ to adjust the slider (-128 to +127).



Phase

Phase should be set automatically by the projector, but can be adjusted manually to correct for shimmering or poor quality definition on, for example, fine text.

- Press ▲ and ▼ to select Phase.
- Press ◀ and ▶ to adjust the slider (0 to 32).

Notes



Horizontal and Vertical Aspect Ratio adjustments are available only when **User** is selected in **Aspect Ratio**, (see previous page).



Keystone adjustment can be found in both the **Geometry** and **Projector Setup** menus.



Phase adjustment can be found in both the **Picture** and **Geometry** menus, and is available for graphics based RGB sources only.

Geometry menu continued**Resolution**

- Press ▲ and ▼ to select Resolution.

Press ► to open the Resolution submenu.

Input	RESOLUTION	
Picture	Input Detection	Automatic
Geometry	Input Standard	
Colour	Total H Samples	
Setup	Active H Samples	
Information	Active V Samples	
	V Offset	

Input Detection

- Press ◀ and ▶ to select from:

Automatic	<i>Allows the projector to automatically detect an appropriate input mode for the signal.</i>
Manual	<i>Allows the user to select an appropriate input mode from a list of common standards.</i>
Custom	<i>Allows the user to completely customise the settings to suit the incoming video signal.</i>

When Input Detection is set to Manual:

- Press ▲ and ▼ to select Input Standard.
- Press ◀ and ▶ to select from:

720p
 XGA
 XGA+
 SXGA-
 SXGA
 SXGA+
 1080p
 UXGA
 VGA
 NTSC
 PAL
 SVGA

Notes
Geometry Menu
Resolution


Input Detection should normally be set to **Automatic**. However, if the incoming video signal is non-standard, the projector may not be able to select an appropriate input mode.

In this case, **Input Detection** should be set to **Manual** or **Custom**.



Input Standard is available only if Input Detection is set to Manual.

Geometry menu continued

When Input Detection is set to Custom:

- Press ▲ and ▼ to select one of the adjustment sliders.

Press ◀ and ▶ to adjust the slider to match the resolution of the incoming video signal.

Input	RESOLUTION			
Picture	Input Detection		Custom	
Geometry	Input Standard			
Colour	Total H Samples	1300	–	+
Setup	Active H Samples	1280	–	+
Information	Active V Samples	720	–	+
	V Offset	31	–	+

Blanking

Blanking curtains can be applied to each edge of the picture.

- Press ▲ and ▼ to select Blanking.

Press ▶ to open the Blanking submenu.

Input	BLANKING		
Picture	Blanking	On	
Geometry	Left	100 -	+
Colour	Right	100 -	+
Setup	Top	100 -	+
Information	Bottom	100 -	+

Blanking On/Off

- Press ◀ and ▶ to select from:

On

Off

Blanking adjust

- Press ▲ and ▼ to select the edge to be Blanked.

Press ◀ and ▶ to adjust the slider (0 to 200).

**Notes**

 The adjustment sliders are available only if Input Detection is set to Custom.

 Total H Samples is available for RGB1 and RGB2 inputs only.

 V Offset is available for DVI input only.



Geometry Menu Blanking

 The blanking curtains will not be applied until **Blanking** is turned On.

 The On Screen Display will move to the centre of the DMD when **Blanking** is turned On.

 Set to zero for no blanking, eg the top edge in this example.

Colour menu

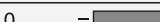
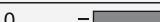
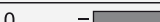
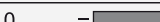


To return to the **main menu**, press  up to three times.

From the main menu:

- Press ▲ and ▼ until **Colour** is highlighted.

Press ► to open the Colour menu. The blue highlight moves to the first item in the menu.

Input	Colour Mode		User
Picture	Temperature	6000K –  +	
Geometry	Red Lift	0 –  +	
Colour	Green Lift	0 –  +	
Setup	Blue Lift	0 –  +	
Information	Red Gain	0 –  +	
	Green Gain	0 –  +	
	Blue Gain	0 –  +	
	Component Type	RGB	
	Trim		

Notes



When using the menus, press **OSD**  or  to hide or reveal the On-Screen-Display.



Colour Menu



Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.



Read these notes on Colour and Global Colourimetry before making any settings in the Colour menus.



Note that any changes made in the **Global Colourimetry menu** (see Setup Menu, later in this section) will affect ALL inputs, modes and presets for which **Global Mode** has been selected in the **Colour menu**.



Notes on Colour and Global Colourimetry

Global Colourimetry menu (see later in this section, in **Setup menu**)

After a calibration check on the projector or venue, a set of Global colour settings can be made in the **Global Colourimetry** menu. These settings are then available to be copied at any time using the **Colour Mode** setting in the **Colour** menu, or used as a starting point using the **Trim** feature in the **Colour** menu.

Colour menu (see this section).

The settings made in the **Colour** menu will be automatically saved in the **Mode History**, or can be manually saved to one of the **Input Presets** (see Input modes and settings earlier in this section).

The selections available in **Colour Mode** in the **Colour** menu are:

Global	Copies the settings made in the Global Colourimetry menu
Temperature	Set the colour temperature using the slider
User	Set the Red, Green and Blue Lift and Gain using the sliders
Peak	Preset high brightness setting
Video, Film,	
Graphic	Applies the factory set P7 settings
ColorMAX User	Applies the User gamma settings made externally using the DP Userware on a personal computer

Colour menu continued

Colour Mode

- Press ▲ and ▼ to select Colour Mode.

Press ◀ and ▶ to select from:

Global

Temperature

User

Peak

Video

Film

Graphic

ColorMAX User 1

ColorMAX User 2

Colour Temperature

- Press ▲ and ▼ to select Temperature.

Press ◀ and ▶ to adjust the slider (3,000K to 10,000K. in 100 steps).

RGB Lift

- Press ▲ and ▼ to select the parameter to be adjusted.

Press ◀ and ▶ to adjust the slider.

RGB Gain

- Press ▲ and ▼ to select the parameter to be adjusted.

Press ◀ and ▶ to adjust the slider.

Component Type

- Press ▲ and ▼ to select Component Type.

Press ◀ and ▶ to select from:

RGB

YPrPb

Notes



Read the notes on Colour and Global Colourimetry earlier in this section before making any settings in the Colour menus.



*Note that any changes made in the **Global Colourimetry menu** (see Setup Menu, later in this section) will affect ALL inputs, modes and presets for which **Global Mode** has been selected in the **Colour menu**.*



*The **Colour Temperature slider** is available only if **Temperature Mode** is selected.*



*The **RGB Lift and Gain sliders** are available only if **User Mode** is selected.*



*The **Component Type selection** is available for **RGB1** and **Component inputs** only.*

Colour menu continued

Trim

- Press ▲ and ▼ to select Trim.
Press ➤ to open the Trim submenu.

Trim RGB Lift and Gain

Input	TRIM		
Picture	Red Lift	0	—  +
Geometry	Green Lift	0	—  +
Colour	Blue Lift	0	—  +
Setup	Red Gain	0	—  +
Information	Green Gain	0	—  +
	Blue Gain	0	—  +
	Global Colourimetry		▶

- Press ▲ and ▼ to select the parameter to be adjusted.
Press ◀ and ▶ to adjust the slider (-128 to +127).

Global Colourimetry

- This is a shortcut to the Global Colourimetry submenu, described later in this section, in Setup Menu.
Press ▲ and ▼ to select Global Colourimetry.
Press ➤ to open the Global Colourimetry submenu.

Notes



The Trim submenu is available only if Global Colour Mode is selected.



Colour Menu
Trim



Read the notes on Colour and Global Colourimetry earlier in this section before making any settings in the Colour menus.

Setup menu

 To return to the **main menu**, press  up to three times.

From the main menu:

- Press ▲ and ▼ until Setup is highlighted.

Press ➤ to open the Setup menu. The blue highlight moves to the first item in the menu.

Input	Projector ▶
Picture	Global Colourimetry ▶
Geometry	Lamp ▶
Colour	On Screen Display ▶
Setup	Password ▶
Information	Communication ▶
	Network ▶
	Restore Defaults ▶
	Centre Lens

Notes

 When using the menus, press **OSD**  or  to hide or reveal the On-Screen-Display.



Setup Menu

Setup menu, continued

Projector

- Press ▲ and ▼ to select Projector.
Press ➤ to open the Projector submenu.

Orientation

Input	PROJECTOR		
Picture	Orientation	Desktop Front	
Geometry	Backlight	On	
Colour	Component Video Sync	Sync On Green	
Setup	Keystone	0	–  +
Information	Test Patterns		

- Press ▲ and ▼ to select Orientation.
Press ◀ and ▶ to select from:

Desktop Front
Desktop Rear
Ceiling Front
Ceiling Rear

Control Panel Backlight

- Press ▲ and ▼ to select Backlight.
Press ◀ and ▶ to select from:

On
Off

Component Video Sync

- Press ▲ and ▼ to select Component Video Sync.
Press ◀ and ▶ to select from:

Sync On Green
Separate

Notes



Setup Menu
Projector

Setup menu, Projector continued

Keystone

Used to correct for distortion caused by the projector being mounted higher or lower than the screen.

- Press ▲ and ▼ to select Keystone.
- Press ◀ and ▶ to adjust the slider (-128 to +127).



Lens Calibration

Calibrate Focus

- Press ▲ and ▼ to select Calibrate Focus.
- Press ▶.

The focus mechanism will operate for about a minute, whilst the minimum and maximum travel distances are determined.

Calibrate Zoom

- Press ▲ and ▼ to select Calibrate Zoom.
- Press ▶.

The zoom mechanism will operate for about a minute, whilst the minimum and maximum travel distances are determined.

Notes



Each time a new lens is fitted to the projector, the calibration procedure must be carried out.

Setup menu, Projector continued

Test Pattern

- Press  and  to select Test Pattern.
- Press  to open the Test Pattern submenu.

Input	TEST PATTERN
Picture	Off
Geometry	Alignment Grid
Colour	Screen Layout
Setup	Chequerboard
Information	Colour Bars
	0% Field
	ColorMAXCalibration
	100% Field (Corrected White)
	100% Field (Peak White)

Press  and  to select from:

- Off
- Alignment Grid
- Screen Layout (shows outlines of various aspect ratios)
- Chequerboard
- Colour Bars
- 0% Field (black)
- ColorMAX Calibration
- 100% Field (Corrected White) (white, affected by colour settings)
- 100% Field (Peak White) (white, unaffected by colour settings)

Notes



Setup Menu
Test Pattern

Setup menu continued**Global Colourimetry**

- Press ▲ and ▼ to select Global Colourimetry.
- Press ► to open the Global Colourimetry submenu.

Input	GLOBAL COLOURIMETRY			
Picture	Mode	Temperature		
Geometry	Temperature	6000K	–	+
Colour	Red Lift	0	–	+
Setup	Green Lift	0	–	+
Information	Blue Lift	0	–	+
	Red Gain	0	–	+
	Green Gain	0	–	+
	Blue Gain	0	–	+

Notes
Setup Menu
Global Colourimetry


Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.



Read these notes on Colour and Global Colourimetry before making any settings in the Colour menus.



Note that any changes made in the **Global Colourimetry** menu will affect ALL inputs, modes and presets for which **Global Mode** has been selected in the **Colour** menu (see **Colour Menu**, earlier in this section).

**Notes on Colour and Global Colourimetry****Global Colourimetry** menu (see [this section](#))

After a calibration check on the projector or venue, a set of Global colour settings can be made in the **Global Colourimetry** menu. These settings are then available to be copied at any time using the **Colour Mode** setting in the **Colour** menu, or used as a starting point using the **Trim** feature in the **Colour** menu.

Colour menu (see [earlier in this section](#)).

The settings made in the **Colour** menu will be automatically saved in the **Mode History**, or can be manually saved to one of the **Input Presets** (see Input modes and settings earlier in this section).

The selections available in **Colour Mode** in the **Colour** menu are:

Global	Copies the settings made in the Global Colourimetry menu
Temperature	Set the colour temperature using the slider
User	Set the Red, Green and Blue Lift and Gain using the sliders
Peak	Preset high brightness setting
Video, Film,	
Graphic	Applies the factory set P7 settings
ColorMAX User	Applies the User gamma settings made externally using the DP Userware on a personal computer

Setup menu, Global Colourimetry continued**Colour Mode**

- Press ▲ and ▼ to select Colour Mode.

Press ◀ and ▶ to select from:

Temperature

User

Peak

Video

Film

Graphic

ColorMAX User 1

ColorMAX User 2

Colour Temperature

- Press ▲ and ▼ to select Temperature.

Press ◀ and ▶ to adjust the slider (3,000K to 10,000K. in 100 steps).

RGB Lift

- Press ▲ and ▼ to select the parameter to be adjusted.

Press ◀ and ▶ to adjust the slider.

RGB Gain

- Press ▲ and ▼ to select the parameter to be adjusted.

Press ◀ and ▶ to adjust the slider.

Notes

Read the notes on Colour and Global Colourimetry earlier in this section before making any settings in the Colour menus.



Note that any changes made in the Global Colourimetry menu will affect ALL inputs, modes and presets for which Global Mode has been selected in the Colour menu (see Colour Menu, earlier in this section).



The Colour Temperature slider is available only if Temperature Mode is selected.



The RGB Lift and Gain sliders are available only if User Mode is selected.

Setup menu, continued

Lamp

- Press ▲ and ▼ to select Lamp.
Press ➤ to open the Lamp submenu.

The middle row shows the current lamp setting.

Input	LAMP
Picture	Current Setting [100%] Lamp1
Geometry	Change Lamp Setting ▶
Colour	
Setup	
Information	

Change Lamp Setting

- Press ▲ and ▼ to select Change Lamp Setting.
Press ➤ to open the Lamp Setting control box.

Change Lamp Setting			
80%	Lamp 1	OK	Cancel

continued

Notes



Setup Menu
Lamp

Setup menu, Lamp continued**Lamp Power**

- Press ◀ and ▶ to select the Lamp Power setting.

Press ▲ and ▼ to adjust the Lamp Power from:

80 to 100% in 1% steps

Lamp Mode

- Press ◀ and ▶ to select Lamp Mode.

Press ▲ and ▼ to select from:

single lamp modes

Lamp 1 lamp 1 only

Lamp 2 lamp 2 only

Alternate on power up, selects the lamp with the least hours used

dual lamp mode

Lamps 1 and 2 both lamps

OK

- Press ◀ and ▶ to select OK.

Press  to apply the new settings.

Cancel

- Press ◀ and ▶ to select Cancel.

Press  or  to exit without applying the new settings.

The indicators on the control panel will show as follows:

Lamp 1 off = OFF

flashing red = LAMP ERROR *green* = ON (100%) *amber* = (80 - 99%)

flashing green = LAMP WARM-UP *flashing amber* = COOL-DOWN

Lamp 2 off = OFF

flashing red = LAMP ERROR *green* = ON (100%) *amber* = (80 - 99%)

flashing green = LAMP WARM-UP *flashing amber* = COOL-DOWN

Notes

In single lamp modes:

- if the running lamp fails, the other lamp will automatically be switched on.

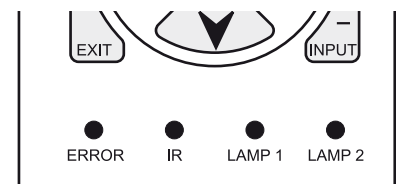


The selected lamp mode:

- will not be applied until **OK** is selected

- will be applied gradually over a period of 30 seconds

- will not be applied until the end of any warm-up or cool-down period that has already started.



Setup menu continued

On Screen Display

- Press  and  to select On Screen Display.
- Press  to open the On Screen Display submenu.

Input	ON SCREEN DISPLAY	
Picture	OSD Position	Lower Centre
Geometry	OSD Size	Large
Colour	Timeout	30 seconds
Setup		
Information		

OSD Position

- Press  and  to select OSD Position

Press  and  to select from:

- Upper Left
- Upper Centre
- Upper Right
- Middle Left
- Middle Centre
- Middle Right
- Lower Left
- Lower Centre
- Lower Right

OSD Size

- Press  and  to select OSD Size.

Press  and  to select from:

- Large
- Small

OSD Timeout

- Press  and  to select the length of the On Screen Display Timeout.
- Press  and  to select from:
 - 0 to 255 in 1 second steps (when set to zero, the OSD never times out)

Notes



Setup Menu
On Screen Display



The On Screen Display will move to the centre of the DMD when **Blanking** is turned On.

(see **Geometry** menu, earlier in this section).



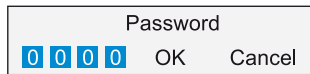
If a menu is opened, and no other key is pressed within the period set in the **OSD Timeout** menu, then the menus will

disappear. When the  key is pressed again, the menus will reopen at the same point they were last viewed.

Setup menu continued**Password**

Entry to the password protected area is available to authorised service personnel only.

- Press ▲ and ▼ to select Password.
Press ► to open the Password control box.



- Press ◀ and ▶ to select each digit in turn.
Press ▲ and ▼ to adjust the digit from:
0 to 9
then move to the next digit.

Use ◀ and ▶ to select from

OK

Press  to enter the password controlled area.

or Cancel

Press  or  to exit without applying the password.

Notes

Setup menu continued**Communication**

- Press ▲ and ▼ to select Communication.

Press ➤ to open the Communication submenu.

Input	COMMUNICATION
Picture	Projector Address ▶
Geometry	
Colour	
Setup	
Information	

Projector Address

The projector and the remote control need to be set to matching addresses. Read the note to the right on this page, and follow the instructions in the order shown below:

- Set the projector address:

Press ➤ to open the Projector address control box.

Projector Address		
00	Apply	Cancel

Press ◀ and ▶ to select the address setting.

Press ▲ and ▼ to adjust the address from:

00 to 99

Use ◀ and ▶ to select from

Apply

Press  to apply the new Projector Address.

or **Cancel**

Press  or  to exit without making the change.

- Set the remote control address as shown in **Using the control keys**, earlier in this section.

Notes
Setup Menu
Communication


When fresh batteries are inserted in the remote control, it will default to address **00**. Remote control **00** is a **master** control, able to control all projectors.

If two or more projectors are set to the same address, they can be controlled from one remote control, provided they are connected by cable or in range of the infra red.

Setup menu continued

Network

- Press  and  to select Network.
- Press  to open the Network submenu.

Input	NETWORK	
Picture	MAC Address	31-FE-A5-81-20-83
Geometry	Connection	Wired 
Colour	DHCP	On 
Setup	IP Address	192.168.3.6
Information	Subnet	255.255.0.0
	Gateway	192.168.9.10
	Wifi Channel	0
	SSID	TITAN

MAC Address

- Projector's unique ID - for information only - cannot be changed.

Connection

- Press  and  to select Connection
- Press  to open the Connection control box.

Connection

Wired

Wireless

Press  and  to select from:

Wired

Wireless

Press  to apply the new Connection setting.

Notes



Setup Menu
Network



Some items may be greyed out or not editable, due to the effect of other settings made in the Network submenu.

For example, if a **Wired Connection** is selected:

Wifi, Channel and SSID will be unavailable.

Setup menu, Network continued

DHCP

- Press  and  to select DHCP
- Press  to open the DHCP control box.



Press  and  to select from:

On

Off

Press  to apply the new DHCP setting.

IP Address

- Press  and  to select IP Address
- Press  to open the IP Address control box.



Use  and  to select each number in turn.

Use  and  to adjust the number
then move to the next number.

Use  and  to select from

Apply

Press  to apply the new IP Address.

or **Cancel**

Press  or  to exit without making the change.

Notes



IP Address cannot be changed if **DHCP** is set to **ON**.

DHCP will set the the address, which will be displayed for information only.

Setup menu, Network continued**Subnet Mask**

- Press  and  to select Subnet

Press  to open the Subnet control box.

Subnet	
255.255.255.254	Apply Cancel

Press  and  to select from:

Automatic

or one of the following:

Class C Masks

255.255.255.254
 255.255.255.252
 255.255.255.248
 255.255.255.240
 255.255.255.224
 255.255.255.192
 255.255.255.128
 255.255.255.0 (selected when setting is Automatic and IP class is C)

Class B Masks

255.255.254.0
 255.255.252.0
 255.255.248.0
 255.255.240.0
 255.255.224.0
 255.255.192.0
 255.255.128.0
 255.255.0.0 (selected when setting is Automatic and IP class is B)

Class A Masks

255.254.0.0
 255.252.0.0
 255.248.0.0
 255.240.0.0
 255.224.0.0
 255.192.0.0
 255.128.0.0
 255.0.0.0 (selected when setting is Automatic and IP class is A)

Use  and  to select from

Apply

Press  to apply the new Subnet Mask.

or **Cancel**

Press  or  to exit without making the change.

Notes

Subnet cannot be changed if DHCP is set to ON.

DHCP will set the the subnet mask, which will be displayed for information only.

Setup menu, Network continued**Gateway Mask**

- Press ▲ and ▼ to select **Gateway**

Press ► to open the **Gateway** control box.

Gateway			
255	255	255	255
Apply Cancel			

Use ◀ and ▶ to select each number in turn.

Use ▲ and ▼ to adjust the number

then move to the next number.

Use ◀ and ▶ to select from

Apply

Cancel

Press  to apply the new Gateway Mask, or to exit without making the change.

Notes

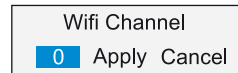
Gateway cannot be changed if DHCP is set to ON.

DHCP will set the the gateway mask, which will be displayed for information only.

Setup menu, Network continued**Wifi Channel**

- Press ▲ and ▼ to select Wifi Channel.

Press ► to open the Wifi Channel control box.



Press ◀ and ▶ to select the channel number.

Use ▲ and ▼ to adjust the channel number from:

0 to 14

Use ◀ and ▶ to select from

Apply

Press  to apply the new Wifi Channel number.

or **Cancel**

Press  or  to exit without making the change.

SSID

- Projector's ID - for information only.

Notes

The **Wifi Channel** setting is not available if **Connection** is set to **Wired**.

Setup menu, continued

Restore Defaults

- Press ▲ and ▼ to select Restore Defaults.

Press ►.

The following message will be displayed.



Press ◀ and ▶ to select from:

Yes

Press OK to confirm your that you really wish to restore all default settings.

- All settings will be restored to factory defaults.

or No

Press OK or EXIT to exit without making the change.

Centre Lens

- Press ▲ and ▼ to select **Centre Lens**.

Press ► to centre the lens.

Notes



Restore Defaults will restore all settings to factory defaults. All ISF settings will be lost (see next page).

If you are not sure this is what you want to do, then either:

make a record of all settings first

or

select **No**, then press OK.



Following a restore to factory defaults, the projector will perform a self-test and enter Standby mode.

This process will take up to 10 seconds. During this time the projector will not respond to any commands.

When complete, all settings will be restored to factory condition and all user settings will be removed except for downloaded colour and gamma parameters.

Information menu



To return to the **main menu**, press  up to three times.

From the main menu:

- Press  and  until Information is highlighted.

Press  to open the Information menu. The blue highlight moves to the first item in the menu.

Input	Projector	
Picture	Source	
Geometry	Digital Projection	
Colour	Distributed By	
Setup		
Information		

Projector Information

- Press  and  to select Projector Information.

Press  to open the Projector Information submenu.

Input	PROJECTOR INFORMATION
Picture	Power On Time 11h:55m
Geometry	Lamp 1 Time 5h:11m Strikes 25
Colour	Lamp 2 Time 12h:43m Strikes 36
Setup	Electronics Version: m102684ai (F8)
Information	Software Version: 2.00 8-dec-2006
	Projector Address: 00
	Projector Model: Titan
	Projector Serial Number: DP01234
	Configuration: 01~000~01

Source Information

- Press  and  to select Source Information.

Press  to open the Source Information submenu.

Input	SOURCE INFORMATION
Picture	Input: DVI
Geometry	Standard: 720p 60
Colour	Frequency V: 60Hz H: 45.0KHz
Setup	
Information	

Notes



When using the menus, press **OSD**  or  to hide or reveal the On-Screen-Display.



Information Menu



If **Distributed By** is visible, then the installer is **ISF Certified**, and the **Save and Delete Preset** options will not be available. Contact the installer for more information.



Information Menu

Projector Information



Information Menu

Source Information

Information menu continued

Digital Projection Information

- Press ▲ and ▼ to select Digital Projection.
Press ➤ to see the DP Information screen.

Input	DIGITAL
Picture	PROJECTION
Geometry	precision displays for every venue
Colour	
Setup	www.digitalprojection.com
Information	

Notes



When using the menus, press
OSD **OFF** or **ON** to hide or
reveal the On-Screen-Display.



Information Menu
DP Contact Information

5. Userware

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Introduction

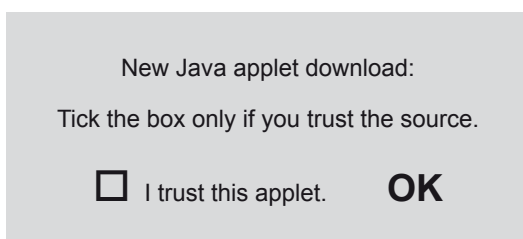
The **Titan Userware** provides an intuitive interface to enable control of many of the features of the projector from a personal computer, via a LAN connection.

There are two versions of the Userware: the **Applet** version, stored on the projector and the **Standalone** version, supplied on disk or from the Digital Projection website.

Applet version

- To activate the Userware, simply point the browser at the projector by typing its **LAN IP Address** into the address bar, then press the **Enter** key or click on **Go**.

The Applet version does not require installation on the personal computer, as it is in the form of a Java applet, downloaded automatically from the projector by the browser. The first time the applet is downloaded, you may see the following message:



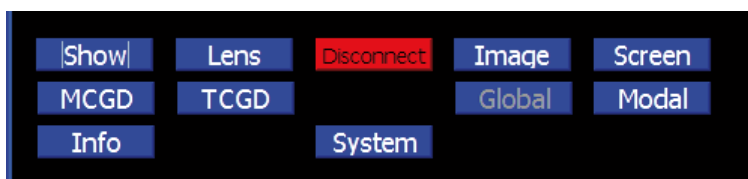
- Tick the box and click **OK**. In future, the Userware will load immediately.

The Userware interface is organised into a number of pages, as listed below:

Show	Lens	Image	Screen
MCGD	TCGD	Global	Modal
Info	System		

Each page is described in full later in this section.

When the Userware is started, the **Show page** will display immediately. The **Page** buttons are always visible at the bottom of the display:



Disconnect

- Click on **Disconnect** to disconnect from the projector.

Reconnect

- To reconnect, click on the browser's **Refresh** button, or re-type the **IP Address** in the browser address box then press **Return**.

Notes

 To use the **Titan Userware** the **Java Runtime Environment** software must be installed on your browser. This software can be downloaded, free of charge from www.java.com.

 The **LAN IP Address** of the projector can be found in the **Network** submenu of the **Setup** menu, as described in section **4. Controlling the projector**.

 Whenever the projector is connected to mains power, whether in **Running** mode or **Standby** mode, the **Applet** version of the Userware will be available.

 The **Applet** version of the Userware can be used only to control the projector from which it was downloaded.

 The Userware can be used to control only one projector at a time, and only one instance can be running at one time.

More than one computer can be used to control more than one projector on the same network.

Standalone version

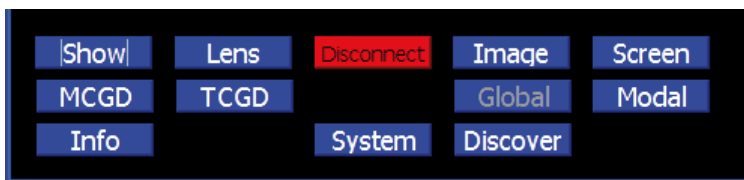
- To install the Userware, simply copy the file (from the CD, or downloaded from the Digital Projection website), to a folder on the computer.
- Double click on the filename to start the software.

The Userware interface is organised into a number of pages, as listed below:

Show	Lens	Image	Screen
MCGD	TCGD	Global	Modal
info	System	Discover	

Each page is described in full later in this section.

When the Userware is started, the **Show page** will display immediately. The **Page** buttons are always visible at the bottom of the display:



Disconnect

- Click on **Disconnect** to disconnect from the projector.

Reconnect

- To reconnect, click on the **Discover** button. The **Discover page** is described in more detail later in this section.

Notes



To use the **Titan Userware** the **Java Runtime Environment** software must be installed on your computer. This software can be downloaded, free of charge from www.java.com.



The Userware can be used to control only one projector at a time, and only one instance can be running at one time.

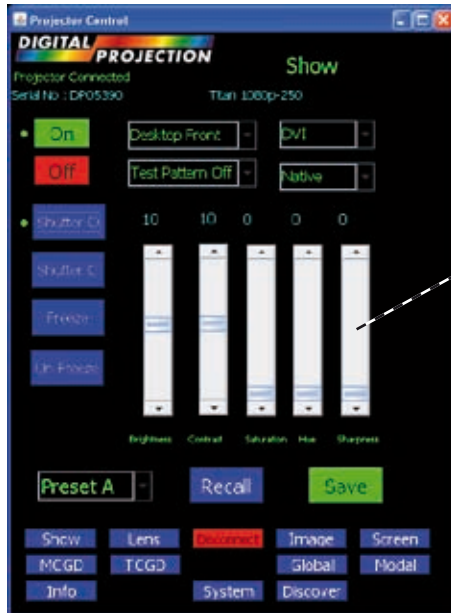
The **Discover** page can be used to switch control between multiple projectors. (see later in this section)

More than one computer can be used to control more than one projector on the same network.

Show page

The Show page is the first to display when the browser connects to the projector.

- To return to the **Show page** at any time, click on **Show**.



Picture
sliders

On / Off

- Click **On** to switch the projector On.
- Click **Off** to switch the projector into Standby mode.

Shutter Open / Closed

- Click on **Shutter O** to open the shutter.
- Click on **Shutter C** to close the shutter.

Freeze / Un-Freeze

- Click on **Freeze** to freeze the display on the current frame.
- Click on **Un-Freeze** to un-freeze the display.

Picture sliders

- Use the sliders to adjust the **Brightness**, **Contrast**, **Saturation**, **Hue** and **Sharpness** of the display.
- Click on the number above the slider to return to the default value.

Notes

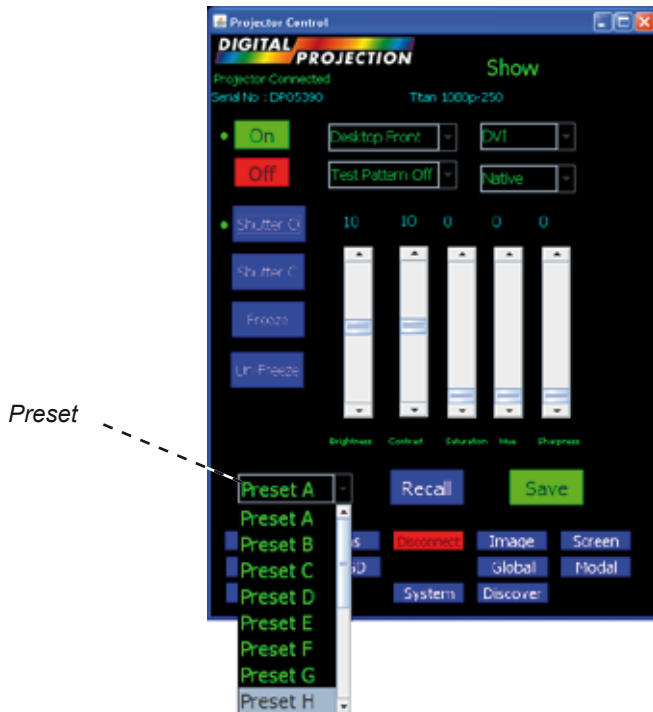
Show page continued

Input Presets

Recall

To recall a set of modal settings that have been saved:

- Click on **Preset**, and select one of the Presets **A - S**, from the drop down menu.



- Click on **Recall**.

The projector will switch to the saved input source, and redetect the input mode before applying the saved modal settings.

Save

To save the current input source, mode and modal settings:

- Click on **Preset**, and select one of the Presets **A - S**, from the drop down menu.
- Click on **Save**.

The modal settings will be saved to the selected preset.

Notes



For more information about input modes and input presets, see **Input modes and settings**, in section 4. **Controlling the Projector**.



A preset can be applied only to the same mode for which it was created. If the detected input mode does not match, then settings from the mode history or mode library will be applied instead.

For more information about input modes, see **Input modes and settings**, in section 4. **Controlling the Projector**.

Show page continued

Orientation

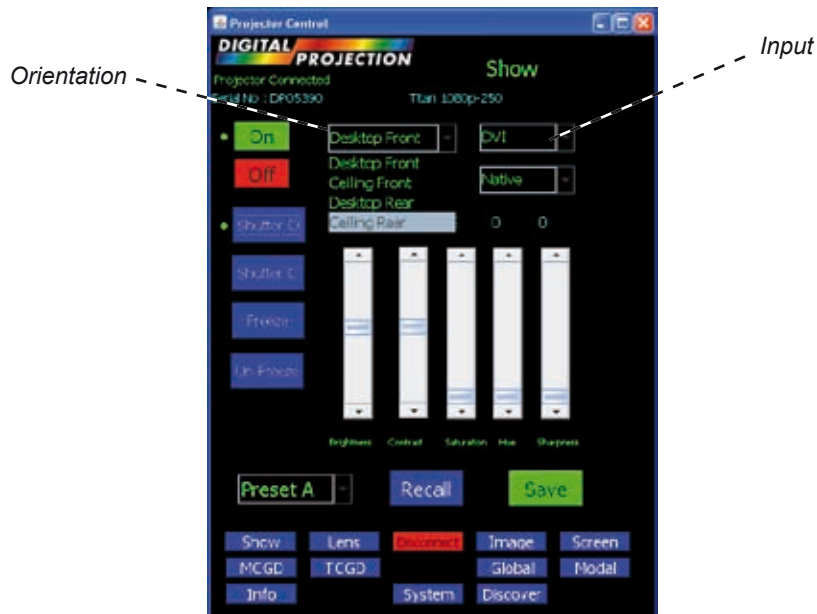
- Click on **Orientation** to select one of the following from the drop down menu:

Desktop Front

Ceiling Front

Desktop Rear

Ceiling Rear



Input

- Click on **Input** to select one of the following from the drop down menu:

RGB1

RGB2

DVI

SDI

Composite Video

S-Video

Component



For more information about input modes, see **Input modes and settings**, in section **4. Controlling the Projector**.

Show page continued

Test Pattern

- Click on **Test Pattern** to select from the drop down menu:



Notes

 For more information about test patterns, see **Setup** menu, in section 4. **Controlling the Projector**.

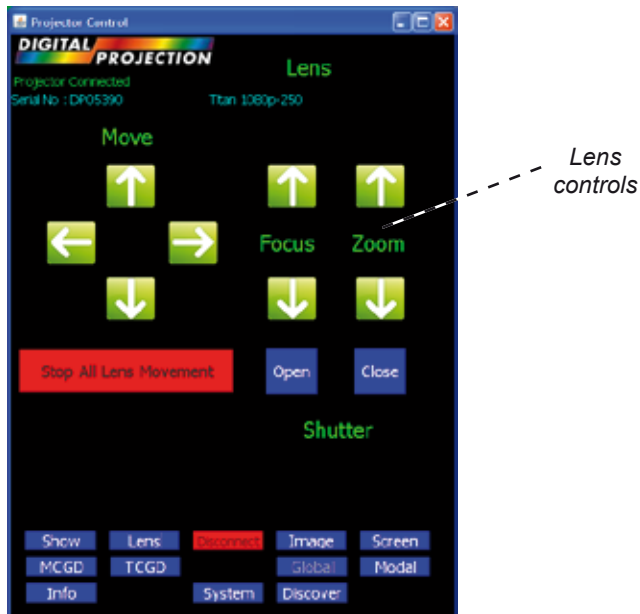
Aspect Ratio

- Click on **Aspect Ratio** to select from the drop down menu.

 For more information about aspect ratios, see **Picture** menu and **Geometry** menu, in section 4. **Controlling the Projector**.

Lens page

- To see the **Lens** page, click on **Lens**.



Lens controls

- Click on the buttons to **Move**, **Focus** and **Zoom** the lens.
- Click on **Stop All Lens Movement** to abort any unwanted lens control movement.

Shutter Open / Closed

- Click on **Shutter Open** to open the shutter.
- Click on **Shutter Close** to close the shutter.

Notes

Image page

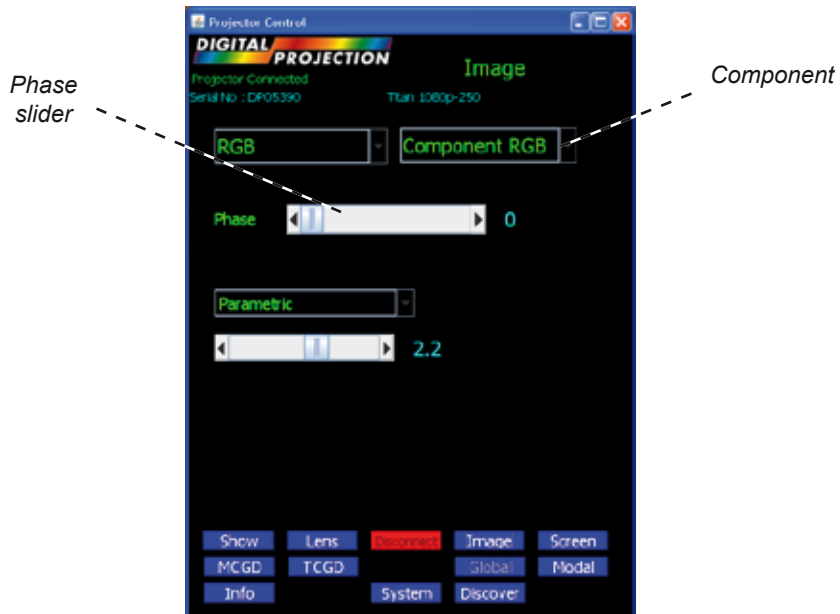
- To see the **Image** page, click on **Image**.

Component

- Click on **Component** to select one of the following from the drop down menu:

Component RGB

Component YUV



Phase slider

- Use the slider to adjust the **Phase**.

Notes

 The **Component** selection is available for the Component input only.

 For more information about phase, see **Picture menu** and **Geometry menu**, in section 4. Controlling the Projector.

 The **Phase** slider is available for RGB1 and RGB2 inputs only.

Image page continued

Colour Space

- Click on **Colour Space** to select one of the following from the drop down menu:

RGB

SMPTE240 YPrPb

REC709 YPrPb

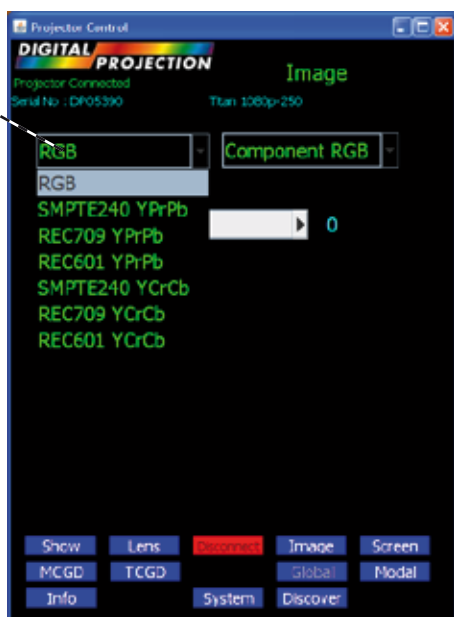
REC601 YPrPb

SMPTE240 YCrCb

REC709 YCrCb

REC601 YCrCb

Colour
Space



Notes

*Image page continued***Gamma**

- Click on **Gamma Correction** to select from the drop down menu:

**Parametric slider**

- Use the slider to adjust the **Gamma** manually.

Parametric
slider

**Notes**

For more information about Gamma, see **Picture** menu, in section 4. **Controlling the Projector**.



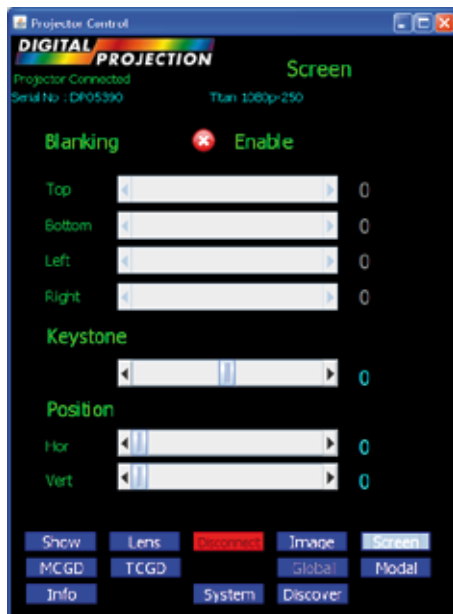
User download of Gamma correction tables is not yet available.



The **Parametric** slider is available only when **Parametric** is selected in **Gamma Correction**.

Screen page

- To see the **Screen** page, click on **Screen**.



Blanking On / Off

- Click on **Enable** to turn the blanking On  or Off .

Blanking adjust

- Use the sliders to adjust the **Top**, **Bottom**, **Left** and **Right** blanking curtains.

Keystone adjust

- Use the slider to adjust the **Keystone** setting.

Position adjust

- Use the sliders to adjust the **Horizontal** and **Vertical** position of the image.

Notes

 The blanking curtains will not be applied until **Blanking** is turned On.

 For more information about blanking, see **Geometry** menu, in section 4. **Controlling the Projector**.

 For more information about keystone adjustment, see **Geometry** menu, in section 4. **Controlling the Projector**.

MCGD page

MCGD - Measured Colour Gamut Data - can be used to correct for a number of environmental variables, for example:

- two or more different projectors
- lamp age
- different lenses
- ambient light
- screen characteristics

The MCGD measurement procedure

- 1 On the **Show** page, select the **ColorMAX** test pattern.
- 2 Using a photo-spectrometer, measure the following values:
White **x** **y**
- 3 On the System page, switch off the Green and Blue DMDs.
- 4 Using a photo-spectrometer, measure the following values:
Red **x** **y**
- 5 Repeat for the Green and Blue x and y values.
- 6 Enter all the values into the **MCGD page**, as described on the next page.

Notes



Read the notes on MCGD, TCGD and ColorMAX below, before making any MCGD settings.



Notes on MCGD, TCGD and ColorMAX User settings

TCGD (see the next section)

The parameters entered on the **TCGD** page establish the target settings that the projector needs to aim for, in order to give a specified colour gamut.

MCGD (see this section)

The parameters entered on the **MCGD** page establish the starting settings, from which the projector will calculate what adjustments are necessary to achieve the color gamut specified on the **TCGD** page.

Only one set of **MCGD** data can be stored on the projector, but many more can be stored on a computer, and retrieved using the **MCGD page** controls.

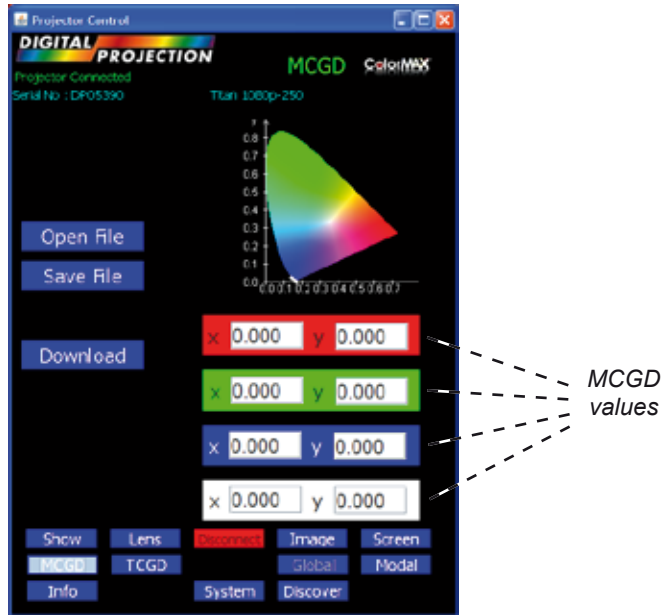
ColorMAX User settings

Only two sets of color gamut parameters can be stored on the projector - **ColorMAX User 1** and **ColorMAX User 2** - but many more can be stored on a computer, and retrieved using the **TCGD page** controls.

MCGD page continued

- To see the **MCGD** page, click on **MCGD**.

On first entering the **MCGD** screen, the MCGD values will show those currently loaded into the projector.

**MCGD values**

- To enter MCGD values, click on each box in turn, and enter the measured **x** and **y** values for each colour.

Download

- Click on **Download** to save the values on screen to the projector.

Save File

- Click on **Save** to save the values on screen to a **MCGD file** on the computer.

When prompted, enter a filename or browse to an existing file that is to be overwritten.

Open File

- To retrieve a set of saved MCGD values, click on **Open**.

When prompted, enter a filename or browse to the file that is to be opened.

Notes

Read the notes on MCGD, TCGD and ColorMAX earlier in this section before making any MCGD settings.



1. New **MCGD** values will not be downloaded to the projector until the **Download** button is pressed.

2. The values will not be used until the **ColorMAX User 1** or **ColorMAX User 2** is chosen in the **Colour** or **Global Colourimetry** menus.

3. If one of the User settings is already in use, then it will be necessary to re-apply it before any change is seen.



MCGD files are named filename.mcgd.

TCGD page

TCGD - Target Colour Gamut Data - can be used to match the display to a pre-defined colour gamut, for example:

- to match the MCGD values from another projector
- to match a specification from the film maker

- To see the **TCGD** page, click on **TCGD**.



TCGD values

TCGD values

- To enter **TCGD** values manually, click on each box in turn, and enter the **x**, **y** and **g** values for each colour.

x and **y** are the colour coordinates, and **g** is gain.

g represents the luminance of the colour relative to luminance of the white point. When **g** is set to zero the system will automatically calculate the most efficient value of **g** to maximise the projector's light output.

The example below shows what is required to set the projectors colour gamut to Rec 709:

Red	x	0.64	y	0.33	g	0.0
Green	x	0.3	y	0.6	g	0.0
Blue	x	0.15	y	0.06	g	0.0
Magenta	x	0.0	y	0.0	g	0.0
Cyan	x	0.0	y	0.0	g	0.0
Yellow	x	0.0	y	0.0	g	0.0
White	x	0.313	y	0.329	g	0.0

Notes



Read the notes on MCGD, TCGD and ColorMAX earlier in this section before making any TCGD settings.



1. New **TCGD** values will not be applied to the projector until the **Download** button is pressed.

2. The values will not be used until the **ColorMAX User 1** or **ColorMAX User 2** is chosen in the **Colour** or **Global Colourimetry** menus.

3. If one of the **User** settings is already in use, then it will be necessary to re-apply it before any change is seen.

TCGD page continued**Update Graph**

- Click on **Update Graph** to show the effects of the new color gamut graphically.

Save File

- Click on **Save** to save the values on screen to a **TCGD file** on the computer.

When prompted, enter a filename or browse to an existing file that is to be overwritten.

Open File

- To retrieve a set of saved TCGD values, click on **Open** .

When prompted, enter a filename or browse to the file that is to be opened.

Download User 1, User 2

- Click on **Download User 1** or **Download User 2** to save the values on screen to one of the two ColorMAX User settings on the projector.

Read User 1, User 2

- Click on **Read User 1** or **Read User 2** to replace the values on screen with one of the two ColorMAX User settings on the projector.

Notes

Read the notes on MCGD, TCGD and ColorMAX earlier in this section before making any MCGD settings.



TCGD files are named filename.tcgd.

Global Colour page

- To see the **Global** page, click on **Global**.



Global Colour Mode

- Click on **Global Colour Mode** to select from the drop down menu.

Notes



The **Global** page will not be available unless **Global** is selected in **Modal Colour Mode** (see next page).



For more information about colour mode, see **Colour menu**, and **Setup menu**, in section 4. **Controlling the projector**.



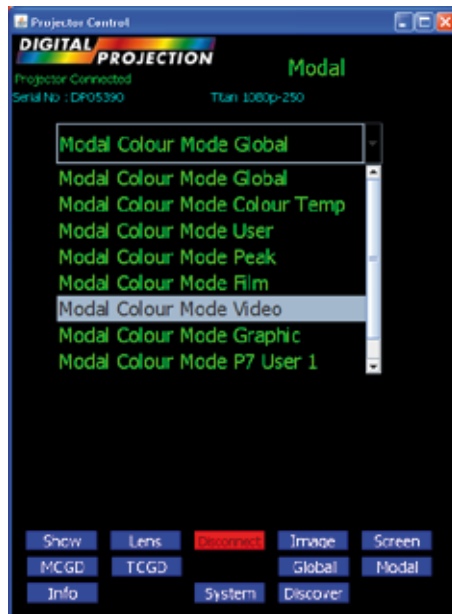
Select **ColorMAX User 1** or **ColorMAX User 2**, to use the **TCGD** values set up on the **TCGD** page.



For more information about **ColorMAX**, read the notes on **MCGD**, **TCGD** and **ColorMAX** earlier in this section

Modal Colour page

- To see the Modal Colour page, click on Modal.



Modal Colour Mode

- Click on **Modal Colour Mode** to select one of the following from the drop down menu.

Notes



For more information about colour mode, see **Colour menu**, and **Setup menu**, in section 4. Controlling the projector.



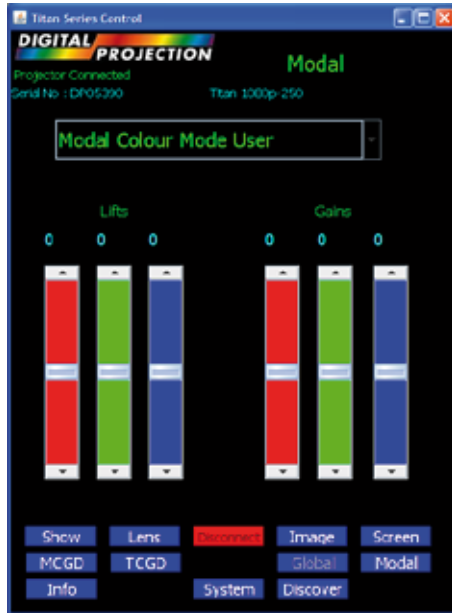
Select **ColorMAX User 1** or **ColorMAX User 2**, to use the TCGD values set up on the TCGD page.



For more information about **ColorMAX**, read the notes on MCGD, TCGD and ColorMAX earlier in this section

Modal Colour page continued**Lift and Gain sliders**

- Use the sliders to adjust the **Lift** and **Gain** for **Red**, **Green** and **Blue** individually.

**Notes**

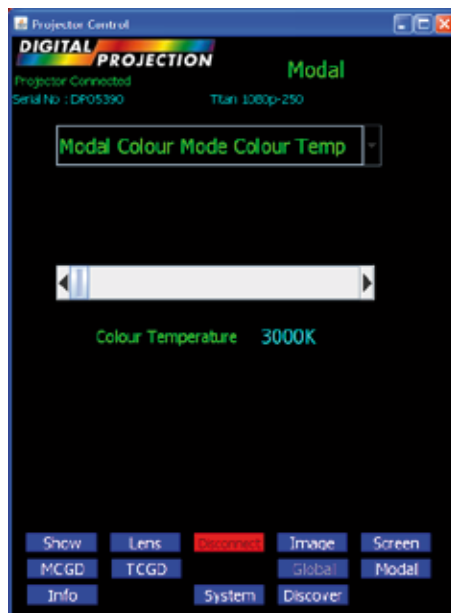
For more information about colour mode, see **Colour** menu, and **Setup** menu, in section 4. Controlling the projector.



The **Lift** and **Gain** sliders are available only when **User** is selected in **Modal Colour** Mode.

Temperature slider

- Use the slider to adjust the **Colour Temperature** between 3,000K and 10,000K.



The **Temperature** slider is available only when **Colour Temperature** is selected in **Modal Colour** Mode.

Information page

- To see the **Information page**, click on **Info**.

Projector Information

- Click on **Projector Information** to see the following information about the projector and the Userware:



Digital Projection

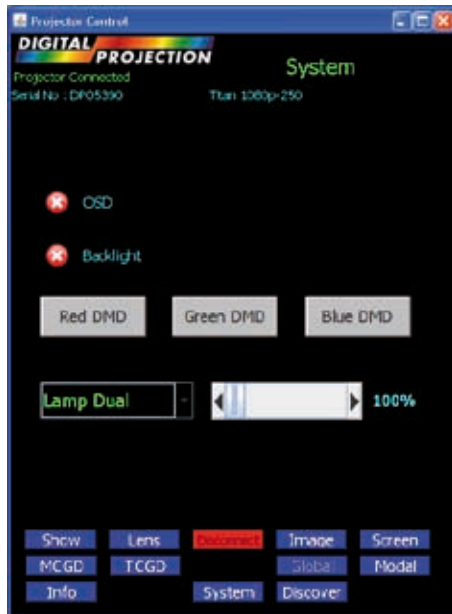
- Click on **Digital Projection** to see the following contact information:



Notes

System page

- To see the **System** page, click on **System**.



OSD

- Click on **OSD** to turn the on-screen display On  or Off .

Backlight

- Click on **Backlight** to turn the control panel backlight On  or Off .

DMD controls

- Click on the **DMD** buttons to turn each DMD **On** or **Off**.

Lamp mode

- Click on **Lamp mode** to select one of the following from the drop down menu:

Dual

Alternate

Lamp 1

Lamp 2

Lamp Power slider

- Use the slider to adjust the lamp power from 80% to 100%.

Notes



For projectors with only one lamp, only Lamp 1 will be available.

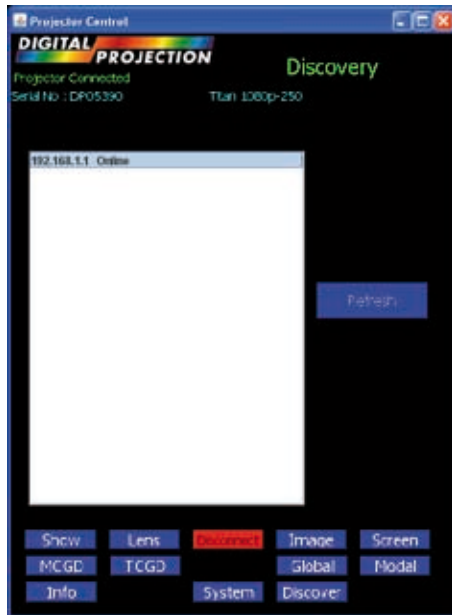
*For more information about lamp mode, see **Setup** menu, in section 4. **Controlling the projector**.*

Discover page

- To see the **Discover page**, click on **Discover**.

If the projector that launched the Userware is still connected, then its **LAN IP address** will be listed in the panel and marked **Online**.

Projector Connected will be shown at the top left, together with the projector's **Serial No** and **Model**.



Disconnect

- Click on **Disconnect** to disconnect from the projector.

Projector Disconnected will be shown at the top left.

Reconnect

- Click on the **LAN IP address** to reconnect to the projector.

Notes



The **Discover page** is available only on the **Standalone** version of the Userware..



The Userware can be used to control only one projector at a time, and only one instance can be running at one time.

The **Discover page** can be used to switch control between multiple projectors.

More than one computer can be used to control more than one projector on the same network.

Refresh

- Click on **Refresh** to search the network for other projectors.

Any projectors previously connected, that are now no longer online, will be marked **Unreachable**.



Connect

- Click on the **LAN IP address** to connect to a projector in the list.

Notes



The **Discover** page is available only on the **Standalone** version of the Userware..



The Userware can be used to control only one projector at a time, and only one instance can be running at one time.

The **Discover** page can be used to switch control between multiple projectors.

More than one computer can be used to control more than one projector on the same network.

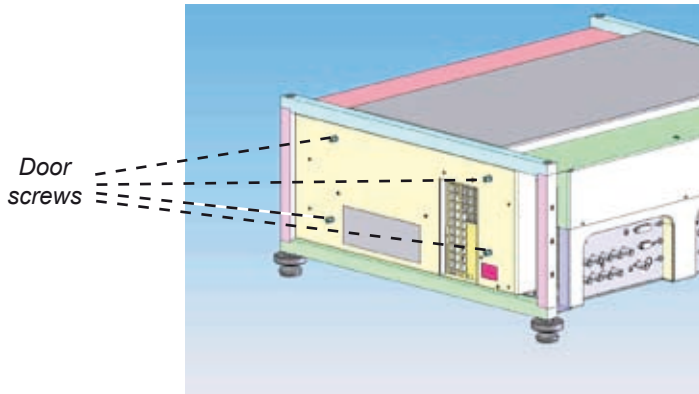
6. Maintenance

Contents

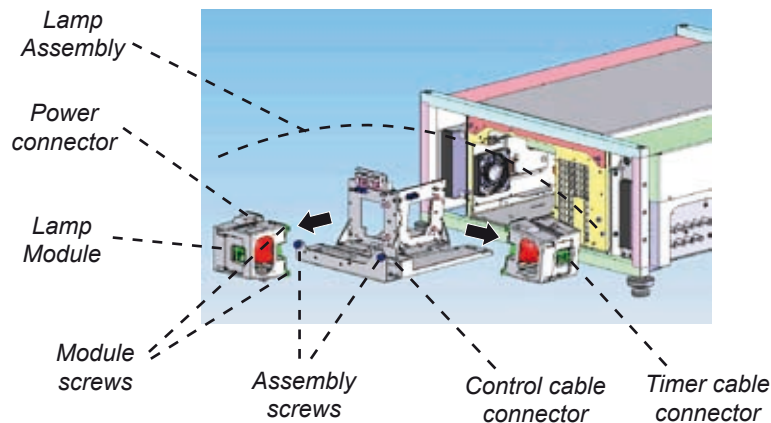
Changing the lamp module	6.2
Changing the air filter	6.3
Cleaning	6.4
Projector	6.4
Lens	6.4
Lamp module	6.4

Changing the lamp module

- Turn the power OFF and allow the lamp to cool for 5 minutes.
- Unscrew the four captive finger screws securing the rear door - the door is tethered, so cannot be removed completely.



- Disconnect the control cable from the rear of the lamp assembly.
- Unscrew the two captive finger screws securing the lamp assembly to the projector, and pull out the whole lamp assembly.
- Disconnect the timer cable from the lamp module to be changed.
- Unscrew the four screws securing the lamp module to the assembly.



- Fit a new lamp module, making sure that the plug on the top of the module mates properly with the power socket on the assembly.
- Tighten the four lamp module fixing screws.
- Reconnect the timer cable.
- Re-fit the lamp assembly, making sure that no cables are trapped.
- Reconnect the control cable.
- Re-fit the rear door, making sure that the door tether is not trapped, and tighten the four screws.

Notes



Always allow the lamp to cool for 5 minutes before:

- disconnecting the power
- moving the projector
- changing the lamp



There are no user-serviceable parts inside the lamp module. The whole module should be replaced.



Only lamps supplied by Digital Projection and intended for this projector should be used. Fitting any other lamp could damage both projector and lamp, and will invalidate the warranty.



At the end of life, the lamp will not strike, and the Lamp Indicator on the control panel will show red. (Typical lamp life is 2000 hours)



Do not use the lamp for more than 2000 hours, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.



Take care not to touch the glass surface of the lamp module. If you do accidentally touch the glass, it should be cleaned before use.



HID lamps produce high intensity light. Do not look directly at the light coming from the lamp housing or the lens.



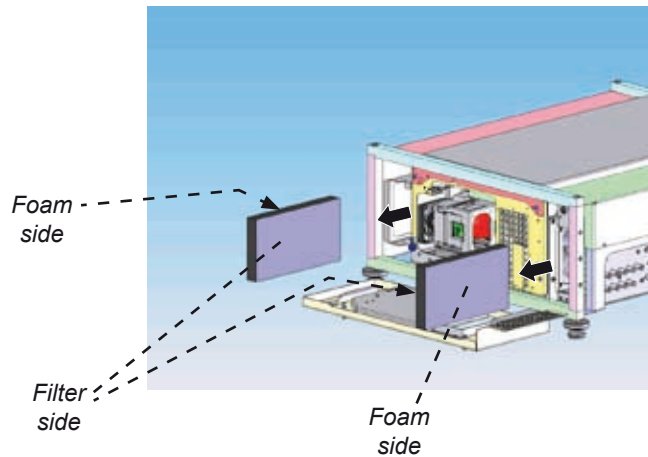
The filter should be changed at the same time as the lamp is changed - see next page.



Opening the rear door will switch the projector OFF. The projector cannot be operated until the door is fully closed.

Changing the air filter

- Turn the power OFF and allow the lamp to cool for 5 minutes.
- Unscrew the four captive finger screws securing the rear door - the door is tethered, so cannot be removed completely.
- Pull out both air filters.
- Fit two new air filters, making sure that they are each the correct way around, as shown below.



- Re-fit the rear door, making sure that the door tether is not trapped, and tighten the four screws.

Notes



Always allow the lamp to cool for 5 minutes before:

- disconnecting the power
- moving the projector
- changing the lamp



The air filter should be changed regularly:

- In a clean environment such as an office, change after 2000 hours, at the same time as the lamp is changed.
- In a dusty or smoky environment such as a theatre or public area, more frequent changes may be necessary.



Opening the rear door will switch the projector OFF.

The projector cannot be operated until the door is fully closed.

Cleaning

Turn the projector off before cleaning.

Projector

Clean the cabinet periodically with a damp cloth. If heavily soiled, use a mild detergent.

Lens

Use a blower or lens paper to clean the lens, taking care not to scratch the glass.

Lamp module

Use a blower or lens paper to clean **ONLY** the glass window, taking care not to scratch the glass.

Notes



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



NEVER touch the lamp or reflector.

7. Appendix

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Troubleshooting

Problem	Possible solutions
The projector will not power up.	Check that the mains plug is plugged in and that the mains supply is switched on. Check any external fuses or breakers.
The projector shuts down after it has been in use for some time.	The projector may be overheating. Check that the air inlets and outlets are clear of any obstruction. Check that the air filter is clean, and if it is dirty, fit a new one. See section 1. Introduction, Getting to know the projector
No image is displayed.	Check the lamp indicators on the control panel. If both indicators are red, then both lamps are faulty. See section 5. Maintenance, Changing the lamp Check that the input source is switched on and connected to the projector correctly. Check that the correct image source is selected. See section 4. Controlling the projector, Using the control keys and Input menu Check that the brightness and contrast settings are set correctly. See section 4. Controlling the projector, Picture menu The projector may be overheating. Check that the air inlets and outlets are clear of any obstruction. Check that the air filter is clean, and if it is dirty, fit a new one.
The image does not fit the screen correctly.	Check that the correct lens is being used for the combination of screen size and projection distance, and that the zoom is adjusted correctly. See section 2. Installation, Choosing a lens Check the image size settings. See section 4. Controlling the projector, Picture or Geometry menus
Uneven image quality.	Check that the projector is parallel to the screen. Check that the screen is flat, and securely mounted.

Problem	Possible solutions
Projector does not respond to control commands from a computer.	Check that the LAN or serial cable is connected correctly. See this section 7. Appendix, Connections If using a LAN, check that the address setting is made correctly. See section 4. Controlling the projector, Network menu If using a serial cable, check that the baud rate is set correctly. See this section 7. Appendix, Connections Check that the correct control codes are being used. See Serial communications protocol (available from Digital Projection)
Projector does not respond to control commands from the remote control.	If you are using a cable, check that the cable is connected properly at both ends, that the cable is not damaged and that the cable is no longer than 50m (150ft). If you are not using a cable, check that the infra red windows at the front and rear of the projector are not obstructed. Check that the cable is disconnected from the projector, as this disables the infra red. Check that the batteries are in good condition. Check that the address setting on the remote control is set either to zero, or to the same as the projector. See section 4. Controlling the projector, Communication menu
	In the event that this troubleshooting guide has not solved the problem, then contact your Digital Projection dealer or service centre.

Specifications

Part numbers

Projector	
1080p-600	107-302
1080p-600 with SDI	108-643
Reference	107-973
Reference with SDI	108-644
1080p-700	108-722
Ultra Contrast	108-781
Rigging frame	107-956
Power cable 10A, Europe	102-163
Power cable 13A, North America	102-165
Power cable 10A, United Kingdom	102-180
Remote control	105-023
4x AAA batteries	105-922
Remote cable 5m	102-162
User manual on CD	105-923
Important Information	108-467

Replacement parts

Single 300W Lamp module + air filters	107-694
Two 300W Lamp modules + air filters	107-695
Single 350W Lamp module + air filters	108-772
Two 350W Lamp modules + air filters	108-773

Lenses

0.67 : 1 fixed lens
1.12 : 1 fixed lens (3 - 15m)
1.12 : 1 zoom lens (1.2 - 2m)
1.16 - 1.49 : 1 zoom lens
1.39 - 1.87 : 1 zoom lens
1.87 - 2.56 : 1 zoom lens
2.56 - 4.16 : 1 zoom lens
4.16 - 6.96 : 1 zoom lens
6.92 - 10.36 : 1 zoom lens

High Brightness

105-607
105-608
105-609
109-236
105-610
105-611
105-612
105-613
109-235

High Contrast

107-195
105-608
105-609
109-359
107-196
107-197
107-198
107-199
109-358

Optical

Digital Light Processor

3 x 0.95" Texas Instruments DMD™, resolution 1920 x 1080 pixels

Contrast Ratio

600 and 700	2000:1 full field (±10%)
Reference and Ultra Contrast	5000:1 full field (±10%)

Pixel fill factor

87%

Lamp power

600 and Reference	2 x 300W
700 and Ultra Contrast	2 x 350W

Lamp life (typical)

2000 hours in dual lamp mode, 4000 in single lamp mode

Brightness

1080p-600	10,000 ANSI lumens ($\pm 10\%$) in dual lamp mode
Reference	4,000 ANSI lumens ($\pm 10\%$) in dual lamp mode
1080p-700	10,000 ANSI lumens ($\pm 10\%$) in dual lamp mode
Ultra Contrast	5,000 ANSI lumens ($\pm 10\%$) in dual lamp mode

Colour temperatureNative: 7500°K ($\pm 1000^\circ\text{K}$), White balance adjustment: 3000°K - 10000°K**Electrical****Inputs**

RGB1, RGB2, DVI, SDI, Composite Video, S-Video, Component (SDI not present on earlier models.)

Pixel clock

up to 165MHz

Control inputs

1 x LAN
1 x wifi LAN
1 x RS232 serial: 19200 baud, 8 bits, 1 stop bit, no parity
1 x remote control

Mains voltage100-240 VAC $\pm 10\%$, 48-62Hz (single phase)**Power consumption**

600 and Reference:	850W single phase, 100-240VAC $\pm 10\%$
700 and Ultra Contrast:	950W single phase, 100-240VAC $\pm 10\%$

International Regulations

Meets FCC Class A requirements
Meets EMC Directives (EN 55022, EN 55024, EN 55103)
Meets Low Voltage Directive (EN60950)

Indicators

Input, Power, Shutter, Error, IR, Lamp 1, Lamp 2

Physical**Operating Temperature**

0 to 40°C

Storage Temperature

-10 to 50°C

Thermal Dissipation

600 and Reference:	2900 BTU/hr
700 and Ultra Contrast:	3241 BTU/hr

Operating Humidity

20% to 80% non-condensing

Weight

approximately 31 kg (68 lbs)



FCC WIFI ID
R68WIPOPT



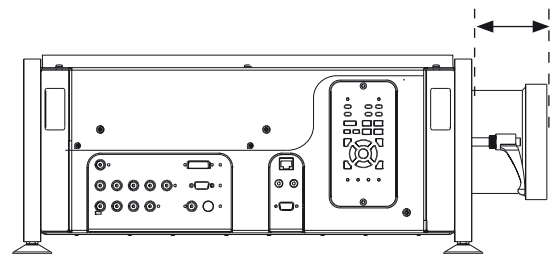
Lens Data

Optical	105-607 ~ 107-195	105-608	105-609	109-236 ~ 109-359	105-610 ~ 107-196
throw ratio	0.67 : 1 fixed	1.12 : 1 fixed	1.12 : 1 fixed	1.16 - 1.49 : 1 zoom	1.39 - 1.87 : 1 zoom
full DMD image width	0.67 : 1 1.64 - 4.78m (5.4 - 15.7ft)	1.12 : 1 2.68 - 13.39m (8.8 - 43.9ft)	1.12 : 1 1.07 - 1.79m (3.5 - 5.9ft)	1.16 : 1 2.59 - 12.93m (8.5 - 42.4ft) 1.49 : 1 2.01 - 10.07m (6.6 - 33ft)	1.39 : 1 2.88 - 17.27m (9.4 - 56.7ft) 1.87 : 1 2.14 - 12.83m (7 - 42.1ft)
throw distance	0.67 : 1 1.1 - 3.2m (3.6 - 10.5ft)	1.12 : 1 3 - 15m (9.8 - 49.2ft)	1.12 : 1 1.2 - 2m (3.9 - 6.6ft)	1.16 : 1 3 - 15m (9.8 - 49.2ft) 1.49 : 1 3 - 15m (9.8 - 49.2ft)	1.39 : 1 4 - 24m (13.1 - 78.7ft) 1.87 : 1 4 - 24m (13.1 - 78.7ft)
lens shift vertical * pixels (vs DMD height)	± 108 (± 0.1H)	+ 756, - 540 (+ 0.7, 0.5H)	+ 756, - 540 (+ 0.7, 0.5H)	± 540 (± 0.5H)	+ 756, - 540 (+ 0.7, 0.5H)
lens shift horizontal * pixels (vs DMD width)	± 192 (± 0.1W)	± 345 (± 0.18W)	± 345 (± 0.18W)	± 345 (± 0.18W)	± 345 (± 0.18W)
Aperture	F/2.5	F/2.5	F/2.5	F/2.5	F/2.5
Max object field size	26.1mm (1.03")	34.6mm (1.36")	34.6mm (1.36")	31.4 mm (1.24")	34.6 mm (1.36")
Effective focal length	14.6mm (0.58")	23.55mm (0.93")	23.55mm (0.93")	24.18 - 31.06 mm (0.95 - 1.22 in)	28.94 - 38.95mm (1.14 - 1.53 in)
Distortion	<0.3%	<0.5%	<0.5%	<0.5%	<0.5%
Transmission	>85%	>88%	>88%	>88%	>88%
Mechanical					
Lens extension** (±2%)	204 mm (8.0 in)	268 mm (10.6 in)	268 mm (10.6 in)	226 mm (8.9 in)	194 mm (7.6 in)
Length	361 mm (14.2 in)	422 mm (16.6 in)	422 mm (16.6 in)	378 mm (14.9 in)	345 mm (13.6 in)
Maximum diameter	163 (6.4 in)	169 mm (6.7 in)	169 mm (6.7 in)	139 mm (5.5 in)	139 mm (5.5 in)
Weight ±0.05 kg (±0.1lb)	5.40 kg (11.9 lb)	5.85 kg (12.9 lb)	5.85 kg (12.9 lb)	to be confirmed	6.10 kg (13.4 lb)

* Actual available lens shift is reduced when the lens is to be shifted in two directions combined (see **Shifting the image**, in **section 2. Installation**).

** Lens extension is the distance from the outer end of the lens to the front of the projector. It is important for calculating throw distance accurately (see **Useful lens calculations**, in **section 2. Installation**).

lens extension, measured from front of corner post

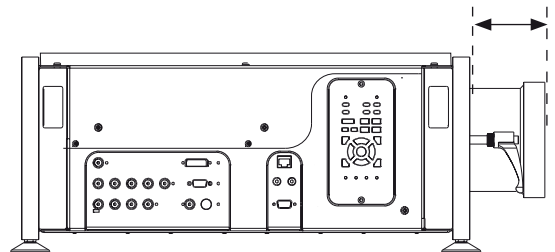


Optical	105-611 ~ 107-197	105-612 ~ 107-198	105-613 ~ 107-199	109-235 ~ 109-358
throw ratio	1.87 - 2.56 : 1 zoom	2.56 - 4.16 : 1 zoom	4.16 - 6.96 : 1 zoom	6.92 - 10.36 : 1 zoom
full DMD image width	1.87 : 1 2.14 - 12.83m (7 - 42.1ft) 2.56 : 1 1.56 - 9.38m (5.1 - 30.8ft)	2.56 : 1 3.55 - 17.58m (11.6 - 57.7ft) 4.16 : 1 2.19 - 10.82m (7.2 - 35.5ft)	4.16 : 1 2.88 - 19.23m (9.4 - 63.1ft) 6.96 : 1 1.72 - 11.49m (5.6 - 37.7ft)	6.92 : 1 2.88 - 19.23m (9.4 - 63.1ft) 10.36 : 1 1.72 - 11.49m (5.6 - 37.7ft)
throw distance	1.87 : 1 4 - 24m (13.1 - 78.7ft) 2.56 : 1 4 - 24m (13.1 - 78.7ft)	2.56 : 1 9.1 - 45m (29.9 - 147.6ft) 4.16 : 1 9.1 - 45m (29.9 - 147.6ft)	4.16 : 1 12 - 80m (39.4 - 262.5ft) 6.96 : 1 12 - 80m (39.4 - 262.5ft)	6.92 : 1 12 - 80m (39.4 - 262.5ft) 10.36 : 1 12 - 80m (39.4 - 262.5ft)
lens shift vertical * pixels (vs DMD height)	+ 756, - 540 (+ 0.7, 0.5H)	+ 756, - 540 (+ 0.7, 0.5H)	+ 756, - 540 (+ 0.7, 0.5H)	+ 756, - 540 (+ 0.7, 0.5H)
lens shift horizontal * pixels (vs DMD width)	± 345 (± 0.18W)	± 345 (± 0.18W)	± 345 (± 0.18W)	± 345 (± 0.18W)
Aperture	F/2.5	F/2.5	F/2.5	F/2.5
Max object field size	34.6 mm (1.36")	34.6 mm (1.36")	34.6 mm (1.36")	34.6 mm (1.36")
Effective focal length	39.0 - 53.43mm (1.54 - 2.1 in)	52.4 - 85.3mm (2.06 - 3.36 in)	84.86 - 142.03mm (3.34 - 5.59 in)	141.2 - 211.4 (5.56 - 8.32 in)
Distortion	<0.5%	<0.5%	<0.5%	<0.5%
Transmission	> 88 %	> 88 %	> 88 %	>88%
Mechanical				
Lens extension** (±2%)	159 mm (6.3 in)	152 mm (6.0 in)	118 mm (4.6 in)	179 mm (7.0 in)
Length	311 mm (12.2 in)	304 mm (12.0 in)	271 mm (10.7 in)	340 mm (13.4 in)
Maximum diameter	139 mm (5.5 in)	139 mm (5.5 in)	139 mm (5.5 in)	139 mm (5.5 in)
Weight	5.15 kg (11.3 lb)	5.25 kg (11.6 lb)	4.70 kg (10.3 lb)	to be confirmed

* Actual available lens shift is reduced when the lens is to be shifted in two directions combined (see **Shifting the image**, in **section 2. Installation**).

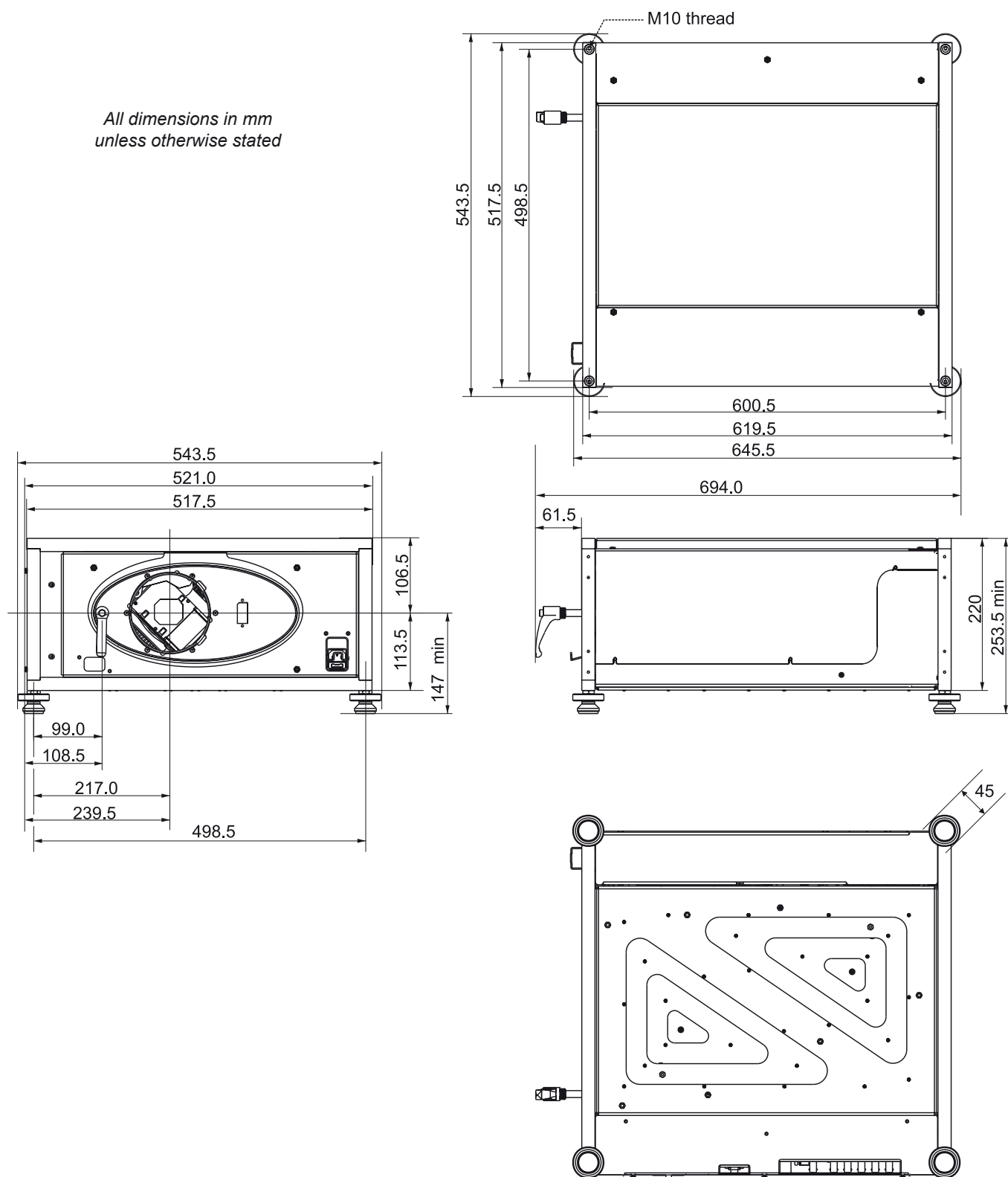
** Lens extension is the distance from the outer end of the lens to the front of the projector. It is important for calculating throw distance accurately (see **Useful lens calculations**, in **section 2. Installation**).

lens extension, measured from front of corner post



Dimensions

*All dimensions in mm
unless otherwise stated*



Input modes supported

* RGB colourspace only

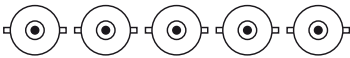
** SDI not present on earlier models

Signal		Resolution	Refresh Rate (Hz)	Total number of lines	Horizontal Frequency (kHz)	COMPOSITE	S-VIDEO	COMPONENT	RGB1 RGB2	DVI	SDI **
SDTV	480i	720 x 480	60	525	15.73	✓	✓	✓			✓
	576i	720 x 576	50	625	15.63	✓	✓	✓			✓
HDTV	480p	720 x 480	60	525	31.51				✓	✓	
	576p	720 x 576	50	625	31.25				✓	✓	
	720p50	1280 x 720	50	750	37.51				✓	✓	✓
	720p60	1280 x 720	60	750	45.00				✓	✓	✓
	1080psf24	1920 x 1080	48	1125	27.00				✓	✓	✓
	1080p24	1920 x 1080	24	1125	27.00				✓	✓	✓
	1080i50	1920 x 1080	50	1125	28.13				✓	✓	✓
	1080p25	1920 x 1080	25	1125	28.13				✓	✓	✓
	1080i60	1920 x 1080	60	1125	33.75				✓	✓	✓
	1080p30	1920 x 1080	30	1125	33.75				✓	✓	✓
	1080p50	1920 x 1080	50	1125	56.24				✓ *	✓ *	
	1080p60	1920 x 1080	60	1125	67.48				✓ *	✓ *	
COMPUTER	480p	640 x 480	60	525	31.51				✓	✓	
	VGA72	640 x 480	72	520	37.86				✓	✓	
	VGA75	640 x 480	75	500	37.51				✓	✓	
	VGA85	640 x 480	85	509	43.27				✓	✓	
	WVGA60	848 x 480	60	517	31.02				✓	✓	
	SVGA56	800 x 600	56	625	35.16				✓	✓	
	SVGA60	800 x 600	60	628	37.89				✓	✓	
	SVGA72	800 x 600	72	666	48.08				✓	✓	
	SVGA75	800 x 600	75	625	46.88				✓	✓	
	SVGA85	800 x 600	85	631	53.68				✓	✓	
	XGA60	1024 x 768	60	806	48.38				✓	✓	
	XGA70	1024 x 768	70	806	56.50				✓	✓	
	XGA75	1024 x 768	75	800	60.02				✓	✓	
	XGA85	1024 x 768	85	808	68.68				✓	✓	
	XGA+75	1152 x 864	75	900	67.52				✓	✓	
	WXGA60	1280 x 768	60	798	47.78				✓	✓	
	WXGA60	1280 x 800	60	831	49.70				✓	✓	
	WXGA60	1280 x 960	60	831	49.70				✓	✓	
	WXGA60	1360 x 768	60	798	47.72				✓	✓	
	WXGA+60	1440 x 900	60	934	55.94				✓	✓	
	SXGA-60	1280 x 960	60	1000	60.02				✓	✓	
	SXGA-85	1280 x 960	85	1011	85.98				✓	✓	
	SXGA60	1280 x 1024	60	1066	64.02				✓	✓	
	SXGA75	1280 x 1024	75	1072	80.32				✓	✓	
	SXGA85	1280 x 1024	85	1072	91.16				✓	✓	
	SXGA+60	1400 x 1050	60	1089	65.32				✓	✓	
	SXGA+75	1400 x 1050	75	1099	82.30				✓	✓	
	SXGA+85	1400 x 1050	85	1105	93.90				✓	✓	
	UXGA60	1600 x 1200	60	125	75.02				✓	✓	
	VESA1080p	1920 x 1080	60	1120	67.16				✓ *	✓ *	

Input connections

1. RGB1 input

5 x 75 ohm BNC



Used for computer, progressive video and analog HD video.

RGsB	RGBS	RGBHV	YPrPb
R	R	R	Pr/Cr
G + Sync	G	G	Y
B	B	B	Pb/Cb
	Sync	H Sync	
		V Sync	

2. RGB2 input

15 way D-type connector



pin view of female connector

1	R
2	G
3	B
4	unused
5	Digital Ground (H Sync)
6	R Ground
7	B Ground
8	G Ground
9	+5v
10	Digital Ground (V Sync/DDC)
11	unused
12	SDA
13	H Sync
14	V Sync
15	SCL

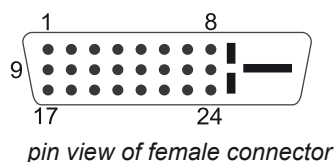
Notes

 To select the sync format for RGB signals, see Setup Menu, in 4. Controlling the Projector.

3. DVI-D input

24 way D-type connector

- 1 TMDS Data 2-
- 2 TMDS Data 2+
- 3 TMDS Data 2 Shield
- 4 unused
- 5 unused
- 6 DDC Clock
- 7 DDC Data
- 8 unused
- 9 TMDS Data 1-
- 10 TMDS Data 1+
- 11 TMDS Data 1 Shield
- 12 unused
- 13 unused
- 14 +5 V Power
- 15 Ground
- 16 Hot Plug Detect*
- 17 TMDS Data 0-
- 18 TMDS Data 0+
- 19 TMDS Data 0+
- 20 TMDS Data 0 Shield
- 21 unused
- 22 unused
- 23 TMDS Clock Shield
- 24 TMDS Clock+

**Notes**

* Hot plug detect (HPD) is fully DVI compliant. DVI sources detect the presence of a display device by providing +5V on pin 14 and looking for +5V on pin 16. Whenever the projector is operational, and 5V is present on pin 14, pin 16 will be held at +5V.

EDID is available even when the projector is switched off.

Operational means that the projector is powered up. Non operational states are powered down and some self test and reprogramming modes.

High Definition Content Protection (HDCP) is supported on this input.

4. SDI input

1 x 75 ohm BNC



SMPTE 292 / HD-SDI signals are very high speed digital signals which require better quality coaxial cable than conventional analogue video. The data rate is 1.5 Gigabits per second.

In choosing cable length and connectors for any installation the frequency response loss in decibels should be proportional to 1Öf, from 1MHz, to 1.5GHz. The following or similar cable specification should be used to ensure fault free communication between source and projector:

Belden 8281 cable or equivalent

Notes

SDI not present on earlier models

5. Composite video input

1 x 75 ohm BNC



PAL or NTSC video

6. S-Video input

4 pin mini-DIN



pin view of female connector

- 1 Y Ground
- 2 C Ground
- 3 Luminance (Y)
- 4 Chrominance (C)

7. Component video input

4 x 75 ohm BNC



Used for standard definition interlaced signals only

RGsB	RGBS	YPrPb
R	R	Pr/Cr
G + Sync	G	Y + Sync
B	B	Pb/Cb
	Sync	



To select the sync format for RGB signals, see Setup Menu, in 4. Controlling the Projector.

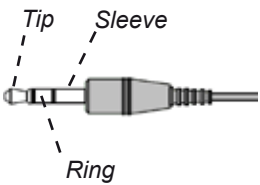
To select between RGB and YPrPb signals, see Colour Menu, in 4. Controlling the Projector.

Control connections

Wired Remote control connection

3.5mm mini jack

Tip	Power
Ring	Signal
Sleeve	Ground



LAN connection

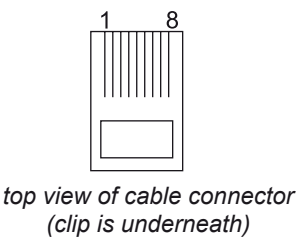
TCP Port number
10001

Wireless
802.11b/g

10BaseT Unshielded Twisted Pair cable

The standard wire colours as as follows:

- 1 White / Orange stripe
- 2 Orange
- 3 White / Green stripe
- 4 Blue
- 5 White / Blue stripe
- 6 Green
- 7 White / Brown stripe
- 8 Brown



Crossed cable

(used to connect directly to a computer with no hub or network.)
(Note that only the green and orange pairs are crossed)

1	White / Orange stripe	White / Green stripe	1
2	Orange	Green	2
3	White / Green stripe	White / Orange stripe	3
4	Blue	Blue	4
5	White / Blue stripe	White / Blue stripe	5
6	Green	Orange	6
7	White / Brown stripe	White / Brown stripe	7
8	Brown	Brown	8

Notes

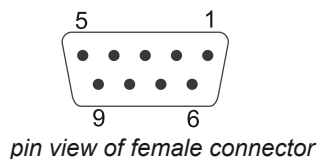
 Note that plugging in the remote control cable will disable the infra-red.

-  Use:
- a straight cable to connect to a hub or network, or
 - a crossed cable as shown here to connect **ONLY** to a computer directly.

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

Serial control input

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

**Null-modem cable**

(used to connect the projector to a computer)

RX	2	---	3	TX
TX	3	---	2	RX
GND	5	---	5	GND

Serial port settings

- Baud rate 19,200 bps
- Data length 8 bits
- Stop bits one
- Parity none
- Flow control none

Notes

The projector is a DTE, so use:

- *a straight cable to connect to a modem, or*
- *a null-modem cable as shown here to connect to another DTE such as a computer.*



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

Remote communications protocol

Version: Revision C 02/01/07

Introduction

This protocol document covers all projectors in the Titan series and also the Lightning 30/40isx+ and 30/40-1080p.

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

Following the transmission of a command, the control system must wait to receive the complete reply before sending a new command.

It should be noted that this protocol is a point to point protocol, and any addressing commands relate to the projector's hand held remote control only.

Message Structure

The data type for all data is raw hexadecimal, and all data larger than 1 byte is formatted little endian i.e. LSB first. There are currently two supported message types:

Operation Messages (message type **03h**)
normal projector operations, fixed length message

Enhanced Messages (message type **10h**)
projector special functions, variable length message

Responses to all commands start with **1Eh**

Notes



Details of how to connect to the projector, using the serial control input or via a LAN, can be found earlier in this section.



The following pages contain an overview of the message structure and examples of some basic Operation commands.

*For full details of all the Operation commands and Enhanced commands, contact Digital Projection at one of the addresses printed near the front of this manual, and ask for a copy of the **Titan Projector Series External Control Protocol**.*

Operation Messages

Operation messages are constructed using the following format:

	Header 2 bytes		Type 1 byte	Size 2 bytes		CRC 2 bytes		Oper'n type 1 byte	Operation 2 bytes		Reserved 2 bytes	
Data	BE	EF	03	19	00	58	58	00	00	00	00	00
Byte #	1	2	3	4	5	6	7	8	9	10	11	12

	Operation Target 4 bytes				Operation Value 4 bytes				Reserved 4 bytes			
Data	00	00	00	00	00	00	00	00	00	00	00	00
Byte #	13	14	15	16	17	18	19	20	21	22	23	24

	Reserved 4 bytes				Reserved 4 bytes			
Data	00	00	00	00	00	00	00	00
Byte #	25	26	27	28	29	30	31	32

Header is always **EFBEh** (byte 1 = **BEh** and byte 2 = **EFh**)

Type is always **03h** for Operation Messages

Size is always **0019h** (byte 4 = **19h** and byte 5 = **00h**) i.e. 25 bytes after CRC

CRC can be set to **5858h** if you want the CRC to be ignored. However, the CRC should ideally be calculated, as described in the **Titan Projector Series External Control Protocol**.

Operation type is one of the following:

Set **01h**
 Get **02h**
 Increment **03h**
 Decrement **04h**
 Execute **05h**

Set writes a value to the projector.

Get reads a value from the projector.

Increment and **decrement** increase or decrease a value by one unit.

Execute executes the current operation (specific commands only).

Spaces in the example messages are for visual clarity and should not be sent as part of the message.

Notes

The following pages contain examples of some basic Operation commands.

For full details of all the Operation commands and Enhanced commands, contact Digital Projection and ask for a copy of the **Titan Projector Series External Control Protocol**.

Enhanced Messages

Enhanced messages are constructed using the following format:

	Header 2 bytes		Type 1 byte	Size 2 bytes		CRC 2 bytes		Data type 2 bytes		Data length (n) 2 bytes	
Data	BE	EF	10	XX	XX	58	58	00	00	00	00
Byte #	1	2	3	4	5	6	7	8	9	10	11

	Data n bytes			
Data	Data bytes ...	...	...	...
Byte #	12	...	...	11 + n

Header is always **EFBEh** (byte 0 = **BEh** and byte 1 = **EFh**)

Type is always **10h** for Enhanced Messages

CRC can be set to **5858h** if you want the CRC to be ignored. However, the CRC should ideally be calculated, as described in the **Titan Projector Series External Control Protocol**.

Size is always Data Length + 4 (4 bytes after CRC and before data)

Notes

The following pages contain examples of some basic Operation commands.

*For full details of all the For full details of all the Operation commands and Enhanced commands, contact Digital Projection and ask for a copy of the **Titan Projector Series External Control Protocol**.*

Operation Command examples

All operation commands are located at bytes 9 & 10.

All values are located at bytes 17 & 18 unless otherwise indicated

Power (0102)

Projector On or Standby

	Value
On	00h
Standby	04h

Examples

Set Projector (On)

BEEF 03 1900 5858 **01 0102** 0000 00000000 **00**000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 **01 0102** 0000 00000000 **00**000000 00000000 00000000 00000000

Set Projector (Standby)

BEEF 03 1900 5858 **01 0102** 0000 00000000 **04**000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 **01 0102** 0000 00000000 **04**000000 00000000 00000000 00000000

Get Projector Power

BEEF 03 1900 5858 **02 0102** 0000 00000000 00000000 00000000 00000000 00000000

Response (Projector in Standby)

1E BEEF 03 1900 5858 **02 0102** 0000 00000000 **04**000000 00000000 00000000 00000000

Notes



Spaces in example messages are for visual clarity and should not be sent as part of the message.



In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Source (3702)**Projector source select**

	Value	
RGB1	00h	
RGB2	01h	
DVI	02h	
SDI	03h	(not used on this projector)
Composite	04h	
SVideo	05h	
Component	06h	

Notes

Spaces in example messages are for visual clarity and should not be sent as part of the message.



In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Examples**Set Source (DVI)**

BEEF 03 1900 5858 **01 3702** 0000 00000000 **02**000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 **01 3702** 0000 00000000 **02**000000 00000000 00000000 00000000

Set Source (SVideo)

BEEF 03 1900 5858 **01 3702** 0000 00000000 **05**000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 **01 3702** 0000 00000000 **05**000000 00000000 00000000 00000000

Get Source

BEEF 03 1900 5858 **02 3702** 0000 00000000 00000000 00000000 00000000 00000000

Response (SVideo)

1E BEEF 03 1900 5858 **02 3702** 0000 00000000 **05**000000 00000000 00000000 00000000

Brightness (E502)**Adjusts Brightness**Range: -128 — +127 (**00h** - **FFh**)Centre (0): 128 (**80h**)**Examples**Set Brightness 97 ($128 + 97 = 225 = \mathbf{E1h}$)BEEF 03 1900 5858 **01 E502** 0000 00000000 **E1**000000 00000000 00000000 00000000**Response**1E BEEF 03 1900 5858 **01 E502** 0000 00000000 **E1**000000 00000000 00000000 00000000**Get Brightness**BEEF 03 1900 5858 **02 E502** 0000 00000000 00000000 00000000 00000000 00000000**Response (97)**1E BEEF 03 1900 5858 **02 E502** 0000 00000000 **E1**000000 00000000 00000000 00000000**Increment Brightness**BEEF 03 1900 5858 **03 E502** 0000 00000000 00000000 00000000 00000000 00000000**Response**1E BEEF 03 1900 5858 **03 E502** 0000 00000000 00000000 00000000 00000000 00000000**Decrement Brightness**BEEF 03 1900 5858 **04 E502** 0000 00000000 00000000 00000000 00000000 00000000**Response**1E BEEF 03 1900 5858 **04 E502** 0000 00000000 00000000 00000000 00000000 00000000**Notes**

Spaces in example messages are for visual clarity and should not be sent as part of the message.



In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Contrast (E602)**Adjusts Contrast**Range: -128 — +127 (**00h** - **FFh**)Centre (0): 128 (**80h**)**Examples**Set Contrast 97 (128 + 97 = 225 = **E1h**)BEEF 03 1900 5858 **01 E602** 0000 00000000 **E1**000000 00000000 00000000 00000000**Response**1E BEEF 03 1900 5858 **01 E602** 0000 00000000 **E1**000000 00000000 00000000 00000000**Get Contrast**BEEF 03 1900 5858 **02 E602** 0000 00000000 00000000 00000000 00000000 00000000**Response (97)**1E BEEF 03 1900 5858 **02 E602** 0000 00000000 **E1**000000 00000000 00000000 00000000**Increment Contrast**BEEF 03 1900 5858 **03 E602** 0000 00000000 00000000 00000000 00000000 00000000**Response**1E BEEF 03 1900 5858 **03 E602** 0000 00000000 00000000 00000000 00000000 00000000**Decrement Contrast**BEEF 03 1900 5858 **04 E602** 0000 00000000 00000000 00000000 00000000 00000000**Response**1E BEEF 03 1900 5858 **04 E602** 0000 00000000 00000000 00000000 00000000 00000000**Notes**

Spaces in example messages are for visual clarity and should not be sent as part of the message.



In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Shutter (CF02)***Closes and opens shutter***

	Target (Set)	Value (Get)
Shutter Close	00h	01h
Shutter Open	01h	00h

Examples***Set Shutter (Close)***

BEEF 03 1900 5858 **01 CF02** 0000 00000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 **01 CF02** 0000 00000000 00000000 00000000 00000000 00000000

Set Shutter (Open)

BEEF 03 1900 5858 **01 CF02** 0000 01000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 **01 CF02** 0000 01000000 00000000 00000000 00000000 00000000

Caution: The Set and Get parameters are different:

Get Shutter

BEEF 03 1900 5858 **02 CF02** 0000 00000000 00000000 00000000 00000000 00000000

Response (Closed)

1E BEEF 03 1900 5858 **02 CF02** 0000 00000000 01000000 00000000 00000000 00000000

Response (Open)

1E BEEF 03 1900 5858 **02 CF02** 0000 00000000 00000000 00000000 00000000 00000000

Notes

Spaces in example messages are for visual clarity and should not be sent as part of the message.



In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Quick Reference chart

COMMAND	HEX DATA (MESSAGE LENGTH = 32 BYTES)	COMMENTS
Switch Projector On	BE EF 03 19 00 58 58 01 01 02 00	
Switch Projector to Standby	BE EF 03 19 00 58 58 01 01 02 00	
Select RGB1 input	BE EF 03 19 00 58 58 01 37 02 00	
Select RGB2 input	BE EF 03 19 00 58 58 01 37 02 00	
Select DVI input	BE EF 03 19 00 58 58 01 37 02 00	
Select SDI input	BE EF 03 19 00 58 58 01 37 02 00	SDI not present on earlier models
Select Composite input	BE EF 03 19 00 58 58 01 37 02 00	
Select SVideo input	BE EF 03 19 00 58 58 01 37 02 00	
Select Component input	BE EF 03 19 00 58 58 01 37 02 00	
Set aspect ratio to Native	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to Fill	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to USER	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to 1.33:1	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to 1.25:1	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to 1.78:1	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to 2.35:1	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to 1.66:1	BE EF 03 19 00 58 58 01 7A 02 00	
Set aspect ratio to 1.85:1	BE EF 03 19 00 58 58 01 7A 02 00	
Select 0% field test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Select 20% field test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Select 80% field test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Select 100% field test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Select chequerboard test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Select colour bars test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Select grid test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Select screen layout test pattern	BE EF 03 19 00 58 58 01 7D 02 00	
Turn test patterns off	BE EF 03 19 00 58 58 05 8F 02 00	
Unblank display	BE EF 03 19 00 58 58 01 87 02 00	
Set Brightness	BE EF 03 19 00 58 58 01 E5 02 00	XX = required brightness. 00h = -128, 80h = 0, FFh = +127
Increment Brightness	BE EF 03 19 00 58 58 03 E5 02 00	
Decrement Brightness	BE EF 03 19 00 58 58 04 E5 02 00	
Set Contrast	BE EF 03 19 00 58 58 01 E6 02 00	XX = required contrast. 00h = -128, 80h = 0, FFh = +127
Increment Contrast	BE EF 03 19 00 58 58 03 E6 02 00	
Decrement Contrast	BE EF 03 19 00 58 58 04 E6 02 00	
Shutter close	BE EF 03 19 00 58 58 01 CF 02 00	Closes optical shutter
Shutter open	BE EF 03 19 00 58 58 01 CF 02 00	Opens optical shutter
Set lamp mode to Dual	BE EF 03 19 00 58 58 01 C5 02 00	
Set lamp mode to Alternate	BE EF 03 19 00 58 58 01 C5 02 00	
Set lamp mode to Single 1	BE EF 03 19 00 58 58 01 C5 02 00	
Set lamp mode to Single 2	BE EF 03 19 00 58 58 01 C5 02 00	

