USA's primary source for projector lamps
myprojectorlamps

PROJECTOR OWNER'S MANUAL

# Optoma

## HD86 / HD87

**Need a replacement lamp for this projector?**

**www.myprojectorlamps.com**

Original manufacturer manual, provided unmodified as a courtesy of MyProjectorLamps.com.
All trademarks belong to their respective owners.

# Table of contents


- Table of Contents ..... 1
- Usage Notice ..... 3
  - *Safety Information ..... 3*
  - *Precautions ..... 4*
  - *Eye Safety Warnings ..... 6*
- Introduction ..... 7
  - *Package Overview ..... 7*
  - *Product Overview ..... 8*
    - *Main Unit ..... 8*
    - *Connection Ports ..... 9*
    - *Remote Control ..... 10*
    - *Backup Remote Control ..... 11*
    - *Coin Cell Battery Replacement ..... 11*
- Installation ..... 12
  - *Connecting the Projector ..... 12*
    - *Connect to Notebook/DVI/VGA-In ..... 12*
  - *Connecting the Projector ..... 13*
    - *Connect to Video Sources ..... 13*
  - *Installing or Removing the Optional Lens ..... 14*
    - *Removing the Existing Lens From the Projector ..... 14*
    - *Installing the New Lens ..... 15*
  - *Powering On/Off the Projector ..... 16*
    - *Powering On the Projector ..... 16*
    - *Powering Off the Projector ..... 17*
    - *Warning Indicator ..... 17*
  - *Adjusting the Projected Image ..... 18*
    - *Adjusting the Projector's Height ..... 18*
    - *Adjusting Projected Image Position Using PureShift ..... 19*
    - *Adjusting Projection Image Size ..... 21*
- User Controls ..... 23
  - *Remote Control ..... 23*
  - *On-screen Display Menus ..... 25*
    - *How to operate ..... 25*
  - *Menu Tree ..... 26*
    - *Image ..... 27*
    - *Image | Advanced ..... 29*
    - *Image | Advanced | PureEngine ..... 31*
    - *Display ..... 32*
    - *System ..... 35*
    - *System | Lamp Settings ..... 38*
    - *System | Startup Image ..... 39*
    - *Setup ..... 40*


English

# Table of contents


Appendicess ..... 43
*Troubleshooting* ..... *43*
*Image Problems* ..... *43*
*Other Problems* ..... *44*
*Projector Status Indication* ..... *45*
*Remote Control Problems* ..... *47*
*Replacing the Lamp* ..... *48*
*Compatibility Modes* ..... *51*
*RS232 Commands and Protocol Function List* ..... *52*
*RS232 Pin Assignments* ..... *52*
*RS232 Protocol Function List* ..... *53*
*Ceiling Mount Installation* ..... *56*
*Optoma Global Offices* ..... *57*
*Regulation & Safety Notices* ..... *59*

# Safety Information

| | |
|---|---|
|  | The lightning flash with arrow head within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons. |
|  | The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance. |

**WARNING:** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

## Class B emissions limits

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

## Important Safety Instruction

1. Do not block any ventilation openings. To ensure reliable operation of the projector and to protect from over heating, it is recommended to install the projector in a location that does not block ventilation. As an example, do not place the projector on a crowded coffee table, sofa, bed, etc. Do not put the projector in an enclosure such as a book case or a cabinet that restricts air flow.
2. Do not use the projector near water or moisture. To reduce the risk of fire and/or electric shock, do not expose the projector to rain or moisture.
3. Do not install near heat sources such as radiators, heaters, stoves or any other apparatus such as amplifiers that emits heat.
4. Clean only with dry cloth.
5. Only use attachments/accessories specified by the manufacturer.
6. Do not use the unit if it has been physically damaged or abused. Physical damage/abuse would be (but not limited to):
   - Unit has been dropped.
   - Power supply cord or plug has been damaged.
   - Liquid has been spilled on to the projector.
   - Projector has been exposed to rain or moisture.
   - Something has fallen in the projector or something is loose inside.

   Do not attempt to service the unit yourself. Opening or removing covers may expose you to dangerous voltages or other hazards. Please call Optoma before you send the unit for repair.
7. Do not let objects or liquids enter the projector. They may touch dangerous voltage points and short out parts that could result in fire or electric shock.
8. See projector enclosure for safety related markings.
9. The unit should only be repaired by appropriate service personnel.

## Precautions



*Please follow all warnings, precautions and maintenance as recommended in this user's guide.*

- Warning- Do not look into the projector's lens when the lamp is on. The bright light may hurt your eyes.
- Warning- To reduce the risk of fire or electric shock, do not expose this projector to rain or moisture.
- Warning- Please do not open or disassemble the projector as this may cause electric shock.
- Warning- When replacing the lamp, please allow the unit to cool down. Follow instructions as described on page 48.
- Warning- This projector will detect the life of the lamp itself. Please be sure to change the lamp when it shows warning messages.
- Warning- Reset the "Lamp Reset" function from the on-screen display "System|Lamp Setting" menu after replacing the lamp module (refer to page 38).
- Warning- When switching the projector off, please ensure the cooling cycle has been completed before disconnecting power. Allow 90 seconds for the projector to cool down.
- Warning- Do not use lens cap when projector is in operation.
- Warning- When the lamp is approaching to the end of its life time, the message "Replacement suggested" will show on the screen. Please contact your local reseller or service center to change the lamp as soon as possible.

Note

When the lamp reaches the end of its life, the projector will not turn back on until the lamp module has been replaced. To replace the lamp, follow the procedures listed under "Replacing the Lamp" section on page 45.

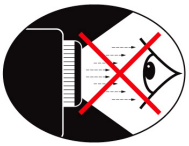
### *Do:*

- Turn off and unplug the power plug from the AC outlet before cleaning the product.
- Use a soft dry cloth with mild detergent to clean the display housing.
- Disconnect the power plug from AC outlet if the product is not being used for a long period of time.

### *Do not:*

- Block the slots and openings on the unit provided for ventilation.
- Use abrasive cleaners, waxes or solvents to clean the unit.
- Use under the following conditions:
  - In extremely hot, cold or humid environments.
    - Ensure that the ambient room temperature is within 5 - 35°C
    - Relative Humidity is 5 - 35°C, 80% (Max.), non-condensing
  - In areas susceptible to excessive dust and dirt.
  - Near any appliance generating a strong magnetic field.
  - In direct sunlight.

## Eye Safety Warnings



- Avoid staring/facing directly into the projector beam at all times. Keep your back to the beam as much as possible.
- When projector is used in a classroom, adequately supervise students when they are asked to point out something on the screen.
- In order to minimize the lamp power, use room blinds to reduce ambient light levels.

# Package Overview

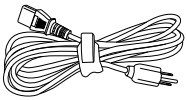
*Unpack and inspect the box contents to ensure all parts listed below are in the box. If something is missing, please contact Optoma customer service.*



Projector with lens cap



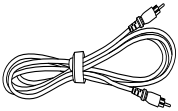
Option lens
(Standard lens, Long throw lens, Short throw lens)



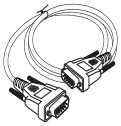
Power Cord 1.8m

**Note**

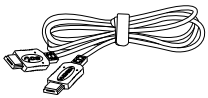
Due to different applications in each Country, some regions may have different accessories.



Composite Video Cable 1.8m
(Not Available in European Version)



RS232 Cable 2.0m



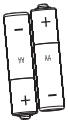
HDMI Cable 1.8m
(Europe Only)



Remote Control



Backup Remote Control



2 x AA Batteries




Backup Remote Battery



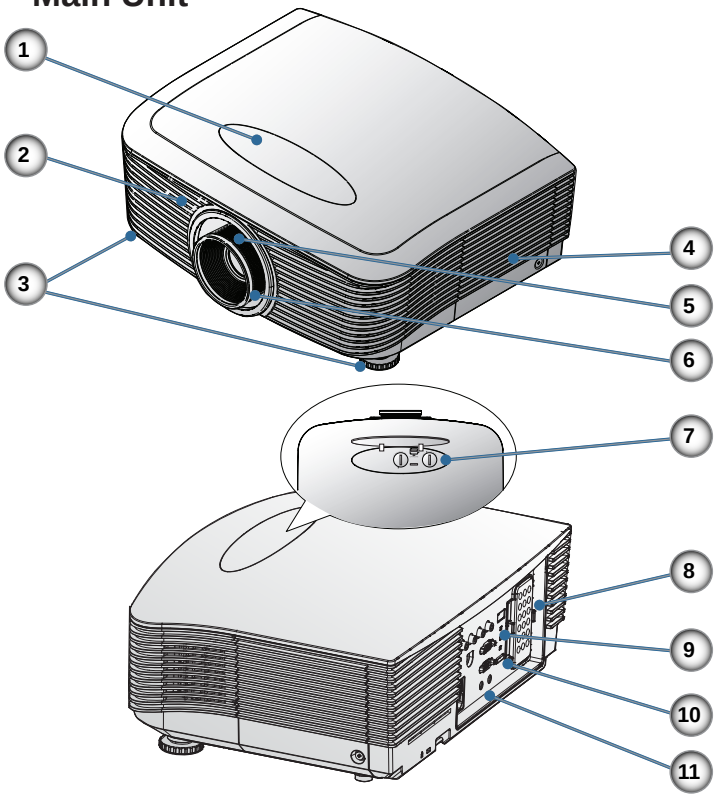
12V Trigger Connector
(EMEA/USA*2, ASIA*1)

Documentation :

- ☑ User's Manual
- ☑ Warranty Card
- ☑ Quick Start Card
- ☑ WEEE Card

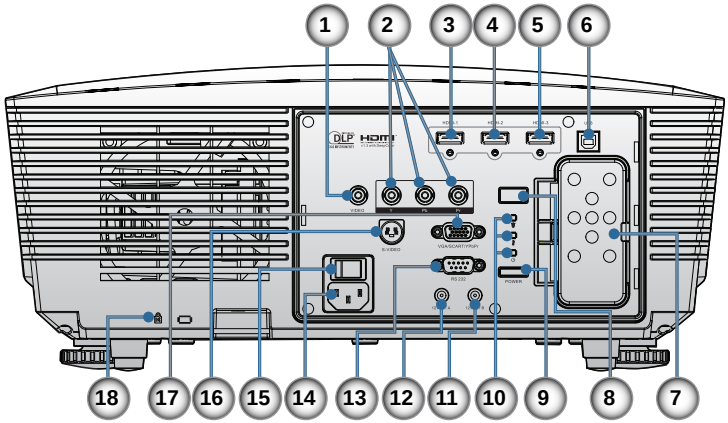
## Product Overview

### Main Unit




1. Lens Shift Adjustment Cover
2. IR Receiver
3. Tilt-Adjustment Feet
4. Lamp Replacement Cover
5. Zoom
6. Focus
7. Vertical and Horizontal Lens Shift Adjustment Control and Lens Release
8. Backup Remote Tray
9. LED Indicators
10. Power Button
11. Connection Ports

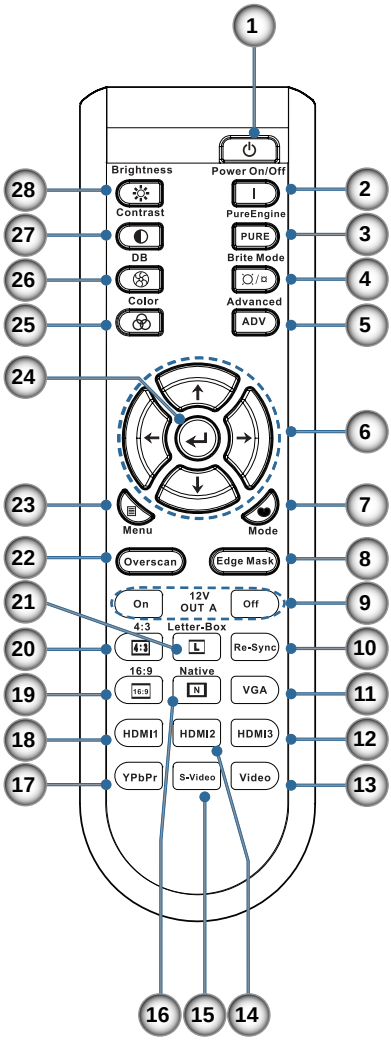
## Connection Ports




1. Composite Video
2. Component Video
3. HDMI 1
4. HDMI 2
5. HDMI 3
6. Service connector (USB B-TYPE )
7. Backup Remote Tray
8. IR Receiver
9. Power Button
10. LED Indicators
11. 12V OUT B
12. 12V OUT A
13. RS232
14. Power Socket
15. Main Power Switch
16. S-Video
17. VGA Input
18. Kensington Microsaver™ Lock Port

## Remote Control

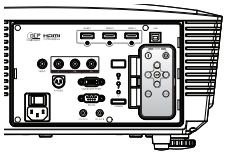
1. Power On
2. Power Off
3. PureEngine
4. Brite Mode
5. Advanced
6. Four Directional Select Keys
7. Mode
8. Edge Mask
9. 12V OUT A On/Off
10. Re-Sync
11. VGA
12. HDMI 3
13. Video
14. HDMI 2
15. S-Video
16. Native
17. YPbPr
18. HDMI 1
19. 16:9
20. 4:3
21. Letter-Box
22. Overscan
23. Menu
24. Enter
25. Color
26. DynamicBlack
27. Contrast
28. Brightness



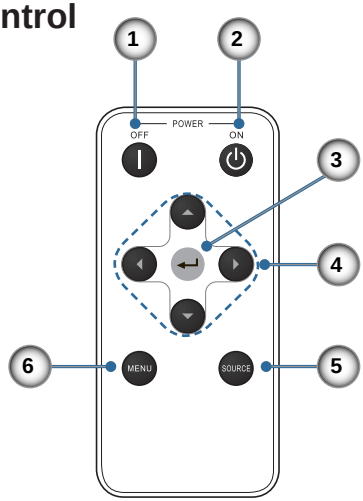
## Backup Remote Control

Note

Backup remote control is magnetically attached to the back I/O of the projector.



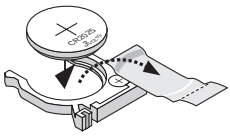
1. Power Off
2. Power On
3. Enter
4. Four Directional Select Keys
5. Source
6. Menu

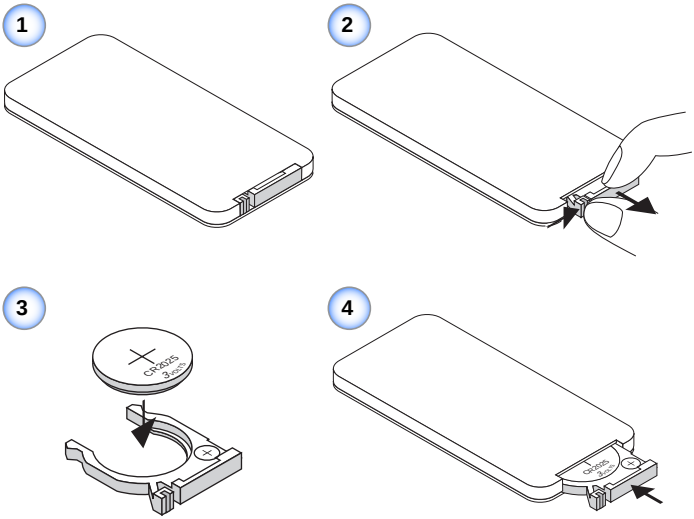



## Coin Cell Battery Replacement

Note

Before using the remote control for the first time, remove the transparent insulation tape.



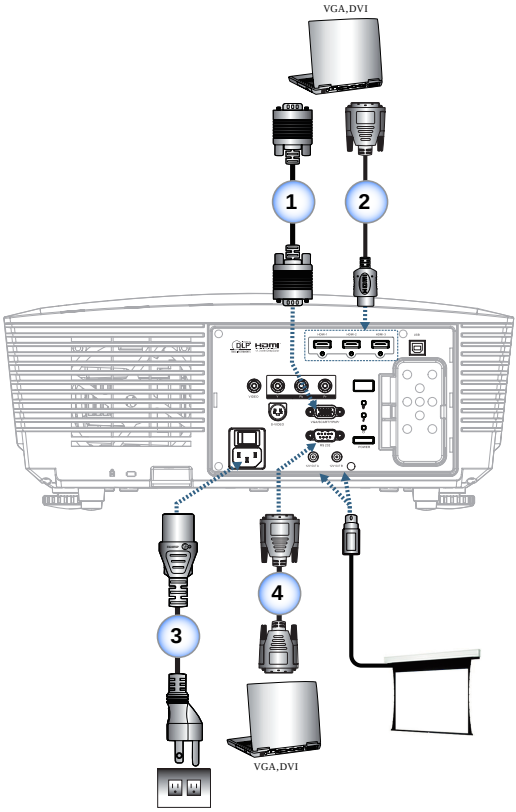


# Connecting the Projector

## Connect to Notebook/DVI/VGA-In

Note

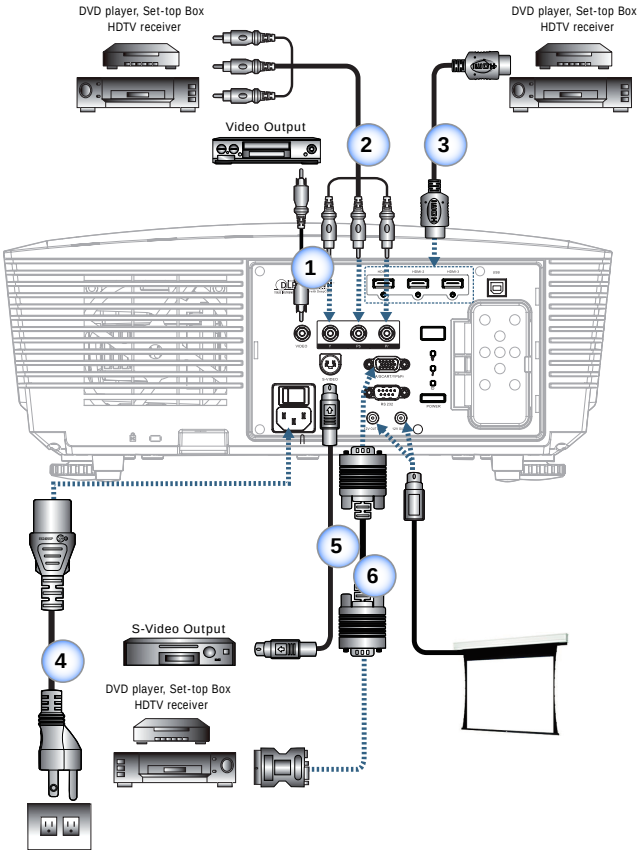
Due to the difference in applications for each country, some regions may have different accessories.




1.....VGA Input Cable (Europe Only)
2.....DVI/HDMI Cable (Optional Accessory)
3.....Power Cord
4.....RS232 Cable (Optional Accessory)

# Connecting the Projector

## Connect to Video Sources




Note

Due to the difference in applications for each country, some regions may have different accessories.

Note

12V OUT is a programmable trigger.

1..... Composite Video Cable (Not Available in European Version)
2.....RCA Component Cable for YPbPr (Optional Accessory)
3.....HDMI Cable (Europe Only)
4.....Power Cord
5..... S-Video Cable (Optional Accessory)
6..... SCART RGB/S-Video Adapter (Europe Only)

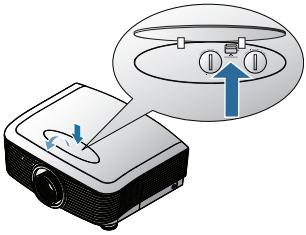
# Installing or Removing the Optional Lens

## *Caution*

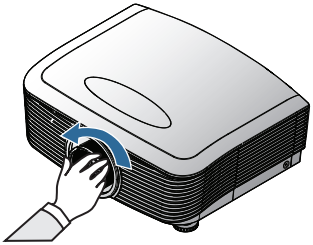
- Do not shake or place excessive pressure on the projector or the lens components as the projector and lens components contain precision parts.
- Before removing or installing the lens, be sure to turn off the projector, wait until the cooling fans stop, and turn off the main power switch.
- Do not touch the lens surface when removing or installing the lens.
- Keep fingerprints, dust or oil off the lens surface. Do not scratch the lens surface.
- Work on a level surface with a soft cloth under it to avoid scratching.
- If you remove and store the lens, attach the lens cap to the projector to keep off dust and dirt.

## Removing the Existing Lens From the Projector

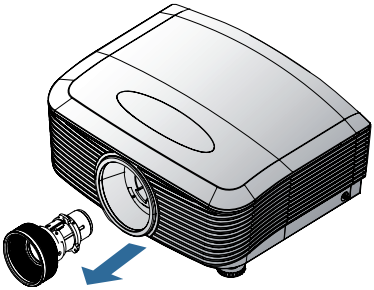
1. Push down and release the top cover to open.
2. Push the LENSE RELEASE button to the unlock position.
3. Grasp the lens.



4. Rotate the lens counterclockwise. The existing lens will be disengaged.



3. Pull out the existing lens slowly.

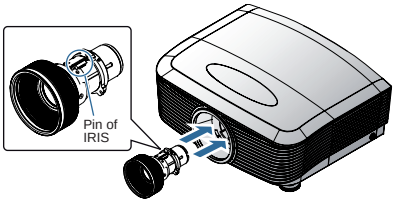


## Installing the New Lens

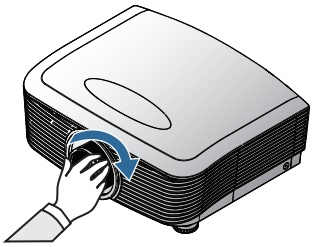
Note

Pin of IRIS should be in the direction as shown in the picture.

1. Align the notches and correctly position the electrical contact pad as shown in the picture.




2. Rotate the lens clockwise until you feel it click into place.



# Powering On/Off the Projector

## Powering On the Projector

1. Remove the lens cap. ❶
2. Securely connect the power cord and signal cable. When connected, the power led will turn red.
3. Turn on the lamp by pressing " POWER " button on the rear of the projector or " " on the remote control.
   The power led " " will now flash blue.❷

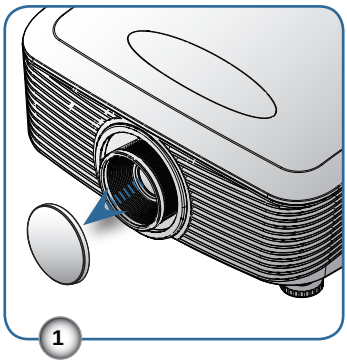
   The startup screen will display in approximately 30 seconds. The first time you use the projector, you can select your preferred language from quick menu after the startup screen display.
4. Turn on your source that you want to display on the screen (computer, notebook, video player, etc). The projector will detect the source automatically and will display on the screen. If not, push menu button and go to "SETUP". Make sure that the "Source Lock" has been set to "Off".

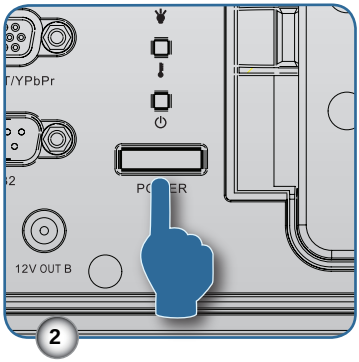
■ If you connected multiple sources at the same time, press the "Source" key on the remote control to switch between inputs.

Note

Turn on the projector first and then select the signal sources.

First time to turn on the projector:
Remember to select the type of lens you have installed. Detail see page 37



## Powering Off the Projector

1. Press the " " button on the remote control or " " button on the rear side of the projector two times with one second interval in between to turn off the projector. First push of button will display the following message on the screen.




   Press the button again to confirm the shut down. If the button is not pressed, the message will disappear in 5 seconds.

2. The cooling fans continue to operate for about 60 seconds for cooling cycle and the Power LED " " will turn blue. When the light is solid red, the projector has entered standby mode.

   If you wish to turn the projector back on, you must wait until the projector has completed the cooling cycle and has entered standby mode. Once in standby mode, simply press " " button on the rear of the projector or " " on the remote control to restart the projector.

3. Disconnect the power cord from the electrical outlet and the projector.
4. Do not turn on the projector immediately following a power off procedure.

## Warning Indicator

Note

Contact the nearest service center if the projector displays these symptoms. See page 57 for more information.

- When the "LAMP" indicator led " " is lit orange, the projector will automatically shut down. Please call the nearest Optoma facility for assistance.
- When the "TEMP" indicator " " turns red, it indicates the projector has overheated. The projector will shut down automatically.
  Under normal conditions, the projector can be switched on again after it has cooled down.
- When the "TEMP" indicator " " flashes red, it indicates the fan has failed.

# Adjusting the Projected Image

## Adjusting the Projector's Height

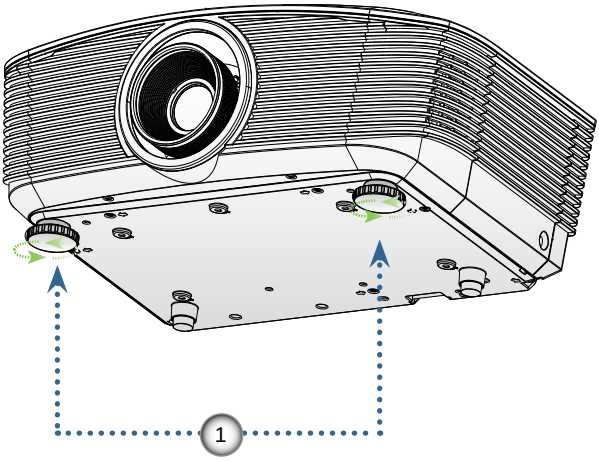
*The projector is equipped with elevator feet for adjusting the image height.*

To raise the image:

Use screw in foot to raise the image to the desired height angle and fine-tune the display angle ❶.

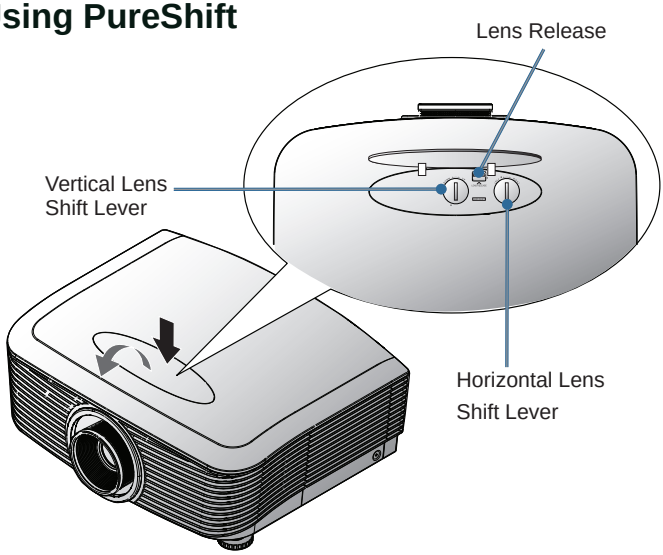
To lower the image:

Use screw in foot to lower the image to the desired height angle and fine-tune the display angle ❶.




Tilt-Adjustment Feet

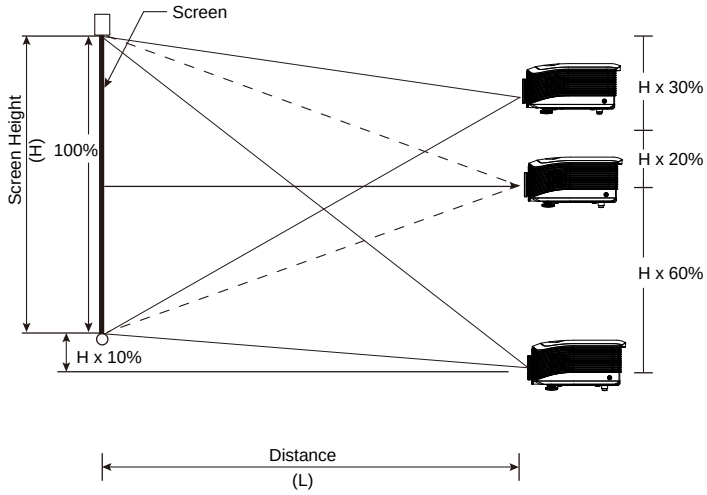
## Adjusting Projected Image Position Using PureShift




The PureShift feature provides a lens shift function that can be used to adjust the position of the projected image either horizontally or vertically within the range detailed below. PureShift is a unique system that provides lens shift while maintaining a much higher ANSI contrast ratio than traditional lens shift systems.

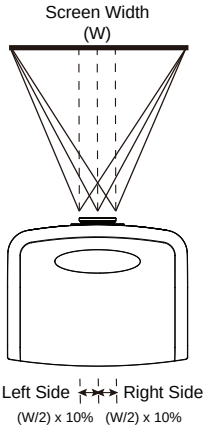
### Adjusting the vertical image position

The vertical image height can be adjusted between 110% and 30% of half image height. Note that the maximum vertical image height adjustment can be limited by the horizontal image position. For example it is not possible to achieve the maximum vertical image position height detailed above if the horizontal image position is at maximum. Please consult the PureShift Range diagram below for further clarification.

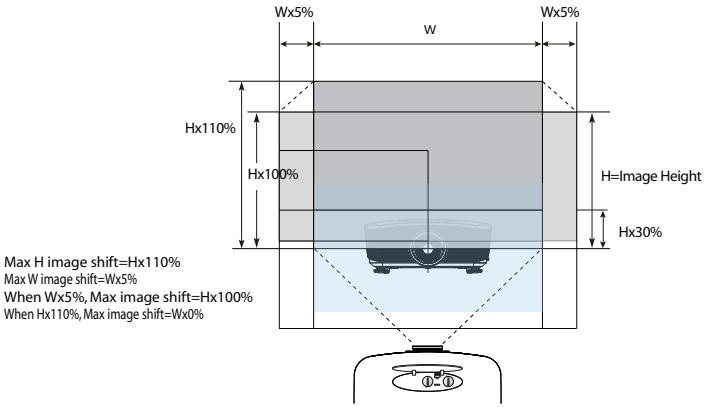



## Adjusting the horizontal image position

With the lens in the center position the horizontal image position can be adjusted to the left or right by up to a maximum of 10% of the half image width. Note that the maximum horizontal image height adjustment can be limited by the vertical image position. For example it is not possible to achieve the maximum horizontal image position if the vertical image position is at maximum. Please consult the PureShift Range diagram below for further clarification.



## PureShift Range Diagram




## Adjusting Projection Image Size

Standard projection lens: TR: Wide – 1.54 Tele – 1.93

Note

TR means “Throw Ratio”.

| Diagonal length (inch) size of 16:9 Screen | Screen Size W X H (16:9) | | | | Projection distance (D) | | | | Offset (Hd) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (m) | | (feet) | | (m) | | (feet) | | | |
| | Width | Height | Width | Height | wide | tele | wide | tele | (m) | (feet) |
| 35 | 0.77 | 0.44 | 2.54 | 1.43 | - | 1.50 | - | 4.91 | 0.48 | 1.57 |
| 45 | 1.00 | 0.56 | 3.27 | 1.84 | 1.53 | 1.92 | 5.03 | 6.31 | 0.62 | 2.02 |
| 50 | 1.11 | 0.62 | 3.63 | 2.04 | 1.70 | 2.14 | 5.59 | 7.01 | 0.68 | 2.25 |
| 60 | 1.33 | 0.75 | 4.36 | 2.45 | 2.05 | 2.56 | 6.71 | 8.41 | 0.82 | 2.70 |
| 70 | 1.55 | 0.87 | 5.08 | 2.86 | 2.39 | 2.99 | 7.83 | 9.81 | 0.96 | 3.15 |
| 80 | 1.77 | 1.00 | 5.81 | 3.27 | 2.73 | 3.42 | 8.95 | 11.21 | 1.10 | 3.60 |
| 90 | 1.99 | 1.12 | 6.54 | 3.68 | 3.07 | 3.85 | 10.07 | 12.62 | 1.23 | 4.04 |
| 100 | 2.21 | 1.25 | 7.26 | 4.09 | 3.41 | 4.27 | 11.19 | 14.02 | 1.37 | 4.49 |
| 120 | 2.66 | 1.49 | 8.72 | 4.90 | 4.09 | 5.13 | 13.42 | 16.82 | 1.64 | 5.39 |
| 150 | 3.32 | 1.87 | 10.89 | 6.13 | 5.11 | 6.41 | 16.78 | 21.03 | 2.05 | 6.74 |
| 205 | 4.54 | 2.55 | 14.89 | 8.38 | 6.99 | - | 22.93 | - | 2.81 | 9.21 |

❖ This graph is for user’s reference only.

Note

TR means “Throw Ratio”.

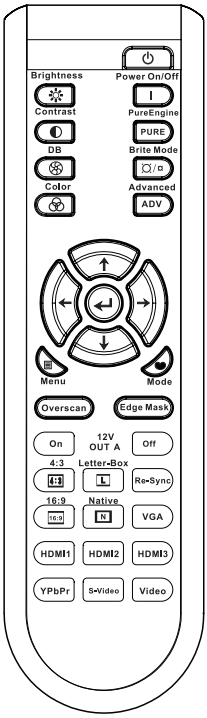
## Long throw projection lens: TR: Wide – 1.93 Tele – 2.89

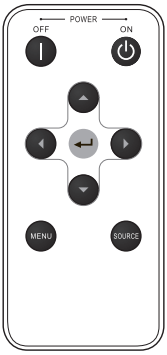
| Diagonal length (inch) size of 16:9 Screen | Screen Size W X H (16:9) | | | | Projection distance (D) | | | | Offset (Hd) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (m) | | (feet) | | (m) | | (feet) | | | |
| | Width | Height | Width | Height | wide | tele | wide | tele | (m) | (feet) |
| 35 | 0.77 | 0.44 | 2.54 | 1.43 | - | 2.24 | - | 7.35 | 0.48 | 1.57 |
| 45 | 1.00 | 0.56 | 3.27 | 1.84 | - | 2.88 | - | 9.45 | 0.62 | 2.02 |
| 50 | 1.11 | 0.62 | 3.63 | 2.04 | 2.14 | 3.20 | 7.01 | 10.50 | 0.68 | 2.25 |
| 60 | 1.33 | 0.75 | 4.36 | 2.45 | 2.56 | 3.84 | 8.41 | 12.59 | 0.82 | 2.70 |
| 70 | 1.55 | 0.87 | 5.08 | 2.86 | 2.99 | 4.48 | 9.81 | 14.69 | 0.96 | 3.15 |
| 80 | 1.77 | 1.00 | 5.81 | 3.27 | 3.42 | 5.12 | 11.21 | 16.79 | 1.10 | 3.60 |
| 90 | 1.99 | 1.12 | 6.54 | 3.68 | 3.85 | 5.76 | 12.62 | 18.89 | 1.23 | 4.04 |
| 100 | 2.21 | 1.25 | 7.26 | 4.09 | 4.27 | 6.40 | 14.02 | 20.99 | 1.37 | 4.49 |
| 150 | 3.32 | 1.87 | 10.89 | 6.13 | 6.41 | 9.60 | 21.03 | 31.49 | 2.05 | 6.74 |
| 200 | 4.43 | 2.49 | 14.53 | 8.17 | 8.55 | 12.80 | 28.04 | 41.98 | 2.74 | 8.99 |
| 300 | 6.64 | 3.74 | 21.79 | 12.26 | 12.82 | 19.19 | 42.05 | 62.97 | 4.11 | 13.48 |
| 400 | 8.86 | 4.98 | 29.05 | 16.34 | 17.09 | 25.59 | 56.07 | 83.96 | 5.48 | 17.98 |
| 468 | 10.36 | 5.83 | 33.99 | 19.12 | 20.00 | 29.94 | 65.60 | 98.24 | 6.41 | 21.03 |

## Short throw projection lens: TR – 0.77

| Diagonal length (inch) size of 16:9 Screen | Screen Size W X H (16:9) | | | | Projection distance (D) | | Offset (Hd) | |
|---|---|---|---|---|---|---|---|---|
| | (m) | | (feet) | | (m) | (feet) | | |
| | Width | Height | Width | Height | | | (m) | (feet) |
| 30 | 0.66 | 0.37 | 2.18 | 1.23 | 0.51 | 1.68 | 0.41 | 1.35 |
| 45 | 1.00 | 0.56 | 3.27 | 1.84 | 0.77 | 2.52 | 0.62 | 2.02 |
| 50 | 1.11 | 0.62 | 3.63 | 2.04 | 0.85 | 2.80 | 0.68 | 2.25 |
| 60 | 1.33 | 0.75 | 4.36 | 2.45 | 1.02 | 3.36 | 0.82 | 2.70 |
| 70 | 1.55 | 0.87 | 5.08 | 2.86 | 1.19 | 3.91 | 0.96 | 3.15 |
| 80 | 1.77 | 1.00 | 5.81 | 3.27 | 1.36 | 4.47 | 1.10 | 3.60 |
| 90 | 1.99 | 1.12 | 6.54 | 3.68 | 1.53 | 5.03 | 1.23 | 4.04 |
| 100 | 2.21 | 1.25 | 7.26 | 4.09 | 1.70 | 5.59 | 1.37 | 4.49 |
| 120 | 2.66 | 1.49 | 8.72 | 4.90 | 2.05 | 6.71 | 1.64 | 5.39 |
| 150 | 3.32 | 1.87 | 10.89 | 6.13 | 2.56 | 8.39 | 2.05 | 6.74 |
| 175 | 3.87 | 2.18 | 12.71 | 7.15 | 2.98 | 9.79 | 2.40 | 7.86 |

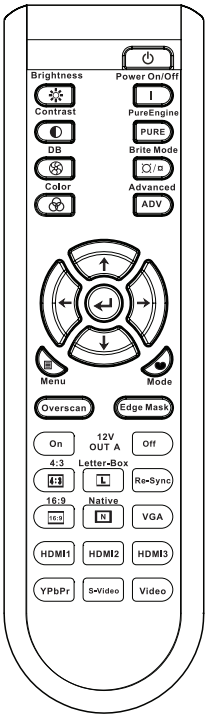
# Remote Control

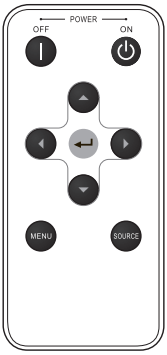



## Using the Remote Control

| | |
|---|---|
| **Power On/Off** | Refer to the “Power On the Projector” section on page 16.<br>Refer to the “Power Off the Projector” section on page 17. |
| **Brightness** | Adjust the brightness of the image. |
| **Contrast** | Control the degree of difference between the lightest and darkest parts of the picture. |
| **PureEngine** | The PureEngine is a collection of advanced image processing technologies that enhances the quality of the displayed image. |
| **DynamicBlack** | Enable the projector to automatically optimize the display of dark movie scenes enabling them to be shown in incredible detail. (refer to page 29) |
| **Brite Mode** | Increase the brightness of the image. (refer to page 38) |
| **Color** | Access the Advanced Color settings. |
| **ADV Advanced** | Access the Advanced Image settings menu. |
| **Enter** | Confirm your item selection. |
| **Four Directional Select Keys** | Use directional select keys to select items or make adjustments to your selection. |
| **Menu** | Display or exit the on-screen display menus for projector. |
| **Mode** | Select the display mode from Cinema, Reference, Photo, Bright, Graphic, ISF Day, ISF Night and User. |
| **Overscan** | Mask off a few pixels on each edge of the image to be displayed. Use the function to adjust if image source happens to have noise near any edge of the display image. |



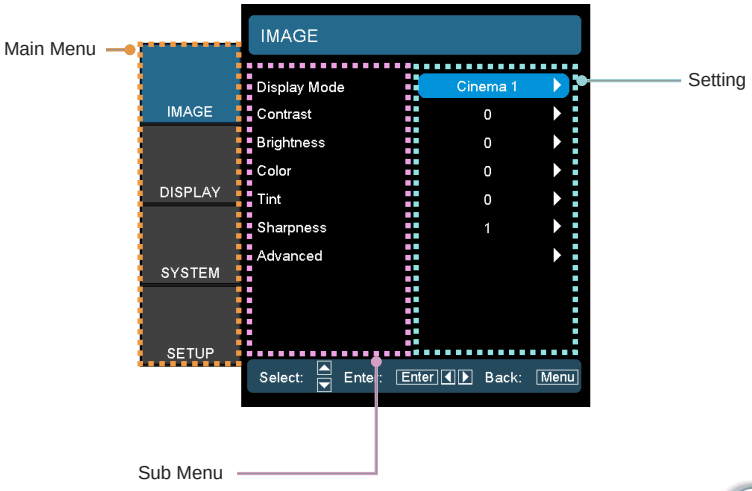

| | |
|---|---|
| **Edge Mask** | Choose “On” to mask off a few pixels on each edge of the image to be displayed. Use Edge Mask “On” if image source happens to have encoding error near any edge of the displayable image. |
| **On** | Activate the 12V OUT A output. |
| **Off** | Deactivate the 12V OUT A output. |
| **4:3 4:3** | Scale the image at a 4:3 aspect ratio. |
| **L Letter Box** | Enable the viewing of the letterboxed nonanamorphically enhanced movie at full screen width. Part of the original image will be lost if the image aspect ratio is less than 2.35:1. |
| **Re-Sync** | Automatically synchronize the projector to the input source. |
| **16:9 16:9** | Scale the image at a 16:9 aspect ratio. |
| **N Native** | The input source will be displayed without scaling. |
| **VGA** | Press “VGA” to choose source from VGA connector. |
| **HDMI 1** | Press “HDMI 1” to choose source from HDMI 1 connector. |
| **HDMI 2** | Press “HDMI 2” to choose source from HDMI 2 connector. |
| **HDMI 3** | Press “HDMI 3” to choose source from HDMI 3 connector. |
| **YPbPr** | Press “YPbPr” to choose Component Video source. |
| **S-Video** | Press “S-Video” to choose S-video source. |
| **Video** | Press “Video” to choose Composite Video source. |
| **Source** | Press “Source” to choose RGB, Component, S-Video, Composite Video, and HDMI source. |

# On-screen Display Menus

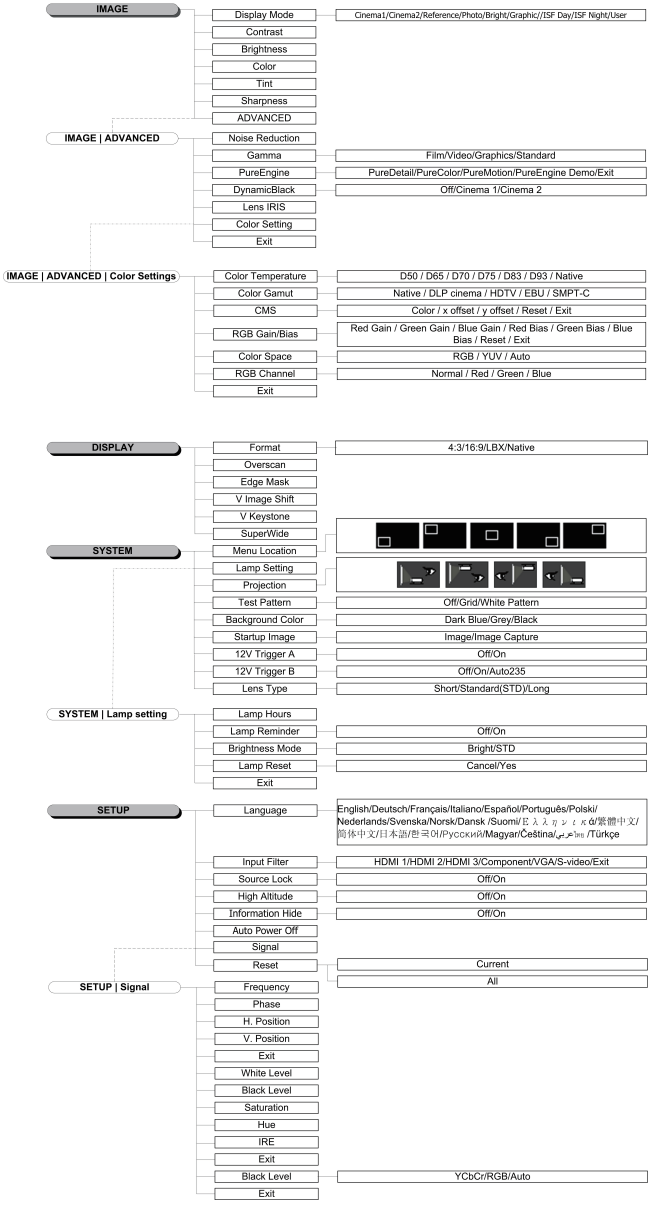
*The Projector has multilingual On-screen Display menus that allow you to make image adjustments and change a variety of settings. The projector will automatically detect the source.*

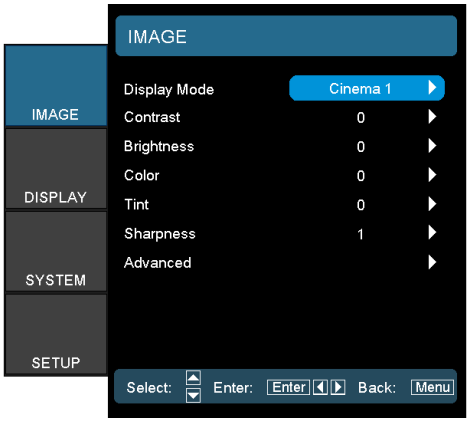
## How to operate

1. To open the OSD menu, press “Menu” on the Remote Control or Control Panel.
2. When OSD is displayed, use ▲ ▼ keys to select any item in the main menu. While making a selection on a particular page, press ◀ ▶ or “Enter” key to enter sub menu.
3. Use ▲ ▼ keys to select the desired item and adjust the settings by ◀ ▶ key.
4. Select the next item to be adjusted in the sub menu and adjust as described above.
5. Press “Enter” or “Menu” to confirm, and the screen will return to the main menu.
6. To exit, press “Menu” again. The OSD menu will close and the projector will automatically save the new settings.



# Menu Tree


IMAGE
Display Mode
Cinema1/Cinema2/Reference/Photo/Bright/Graphic//ISF Day/ISF Night/User
Contrast
Brightness
Color
Tint
Sharpness
ADVANCED
IMAGE | ADVANCED
Noise Reduction
Gamma
Film/Video/Graphics/Standard
PureEngine
PureDetail/PureColor/PureMotion/PureEngine Demo/Exit
DynamicBlack
Off/Cinema 1/Cinema 2
Lens IRIS
Color Setting
Exit
IMAGE | ADVANCED | Color Settings
Color Temperature
D50 / D65 / D70 / D75 / D83 / D93 / Native
Color Gamut
Native / DLP cinema / HDTV / EBU / SMPT-C
CMS
Color / x offset / y offset / Reset / Exit
RGB Gain/Bias
Red Gain / Green Gain / Blue Gain / Red Bias / Green Bias / Blue Bias / Reset / Exit
Color Space
RGB / YUV / Auto
RGB Channel
Normal / Red / Green / Blue
Exit
DISPLAY
Format
4:3/16:9/LBX/Native
Overscan
Edge Mask
V Image Shift
V Keystone
SuperWide
SYSTEM
Menu Location
Lamp Setting
Projection
Test Pattern
Off/Grid/White Pattern
Background Color
Dark Blue/Grey/Black
Startup Image
Image/Image Capture
12V Trigger A
Off/On
12V Trigger B
Off/On/Auto235
Lens Type
Short/Standard(STD)/Long
SYSTEM | Lamp setting
Lamp Hours
Lamp Reminder
Off/On
Brightness Mode
Bright/STD
Lamp Reset
Cancel/Yes
Exit
SETUP
Language
English/Deutsch/Français/Italiano/Español/Português/Polski/
Nederlands/Svenska/Norsk/Dansk /Suomi/Ελληνικά/繁體中文/
简体中文/日本語/한국어/Русский/Magyari/Čeština/عربي /Türkçe
Input Filter
HDMI 1/HDMI 2/HDMI 3/Component/VGA/S-video/Exit
Source Lock
Off/On
High Altitude
Off/On
Information Hide
Off/On
Auto Power Off
Signal
Reset
Current
All
SETUP | Signal
Frequency
Phase
H. Position
V. Position
Exit
White Level
Black Level
Saturation
Hue
IRE
Exit
Black Level
YCbCr/RGB/Auto
Exit




# Image



## Display Mode

There are many factory presets optimized for various types of images.

- Cinema 1/Cinema 2: For home theater.
- Reference: This mode is intended to reproduce, as close as possible, the image the way the movie director intended. Color, color temperature, brightness, contrast and gamma settings are all configured to standard reference levels.
- Photo: Optimized for displaying photographic images.
- Bright: Optimized for maximum brightness.
- Graphic: Optimized for viewing of animation and games.
- ISF Day: Intended for ISF color alignment.
- ISF Night: Intended for ISF color alignment.
- User: User adjustable settings.

Note

ISF modes are only available through an ISF-certified calibrator.

## Contrast

The contrast controls the degree of difference between the lightest and darkest parts of the picture. Adjusting the contrast changes the amount of black and white in the image.

- Press the ◀ to decrease the contrast.
- Press the ▶ to increase the contrast.

## Brightness

Adjust the brightness of the image.

- Press the ◀ to darken image.
- Press the ▶ to lighten the image.

## Color

Adjust a video image from black and white to fully saturated color.

- Press the ◀ to decrease the color saturation in the image.
- Press the ▶ to increase the color saturation in the image.

## Tint

Adjust the color balance of red and green.

- Press the ◀ to increase the amount of green in the image.
- Press the ▶ to increase the amount of red in the image.

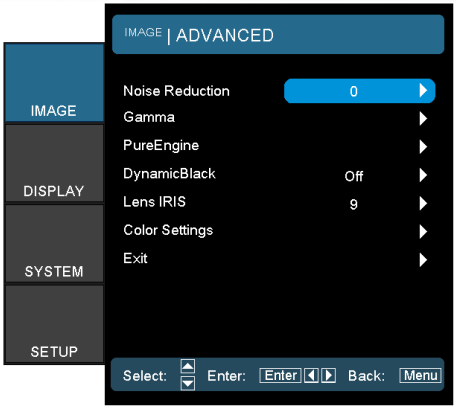
## Sharpness

Adjust the sharpness of the image.

- Press the ◀ to decrease the sharpness.
- Press the ▶ to increase the sharpness.

## Advanced

Use this option to enter the Advanced menu see page 29 and 30.




# Image | Advanced



## Noise Reduction

The motion Adaptive Noise Reduction reduces the amount of visible noise in interlaced signals. The range is from “0” to “10”. (0:Off)

## Gamma

This allows you to set up gamma curve type. After the initial setup and fine tuning is completed, utilize the Gamma Adjustment steps to optimize your image output.

- Film: for home theater.
- Video: for video or TV source.
- Graphics: for image source.
- Standard: for standardized setting.

## PureEngine

The PureEngine is a collection of advanced image processing technologies that enhances the quality of the displayed image.

## DynamicBlack

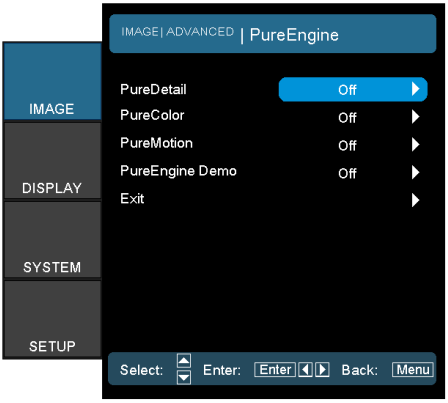
DynamicBlack enables the projector to automatically optimize the display of dark movie scenes enabling them to be shown in incredible detail (Cinema2: maximum effect).

## Lens IRIS

This adjustable item opens and closes the len's iris. The range is from "1" to "9".

## Color Settings

- Color Temperature: Adjust the color temperature. Cold temperature, the screen looks colder; with Warm temperature, the screen looks warmer.
- Color Gamut: Select this menu to optomize the color gamut color range for Native, DLP-C, HDTV, EBU or SMPTE-C.
- CMS: Select this menu to optimize Color Management Settings.
- RGB Gain/Bias: Press ▶ into the next menu as below and then use ▲ or ▼ to select item. Use ◀ or ▶ to select Red, Green, or Blue for brightness (Gain) and contrast (Bias).
- Color Space: Select an appropriate color matrix type from RGB or YCbCr.
- RGB Channel: Select this menu to adjust the RGB Bias and Gain levels for each primary (RGB) color.






# Image | Advanced | PureEngine

## PureDetail

PureDetail is an edge enhancement tool that better defines the edges in the projected image thus providing more perceived detail.

## PureColor

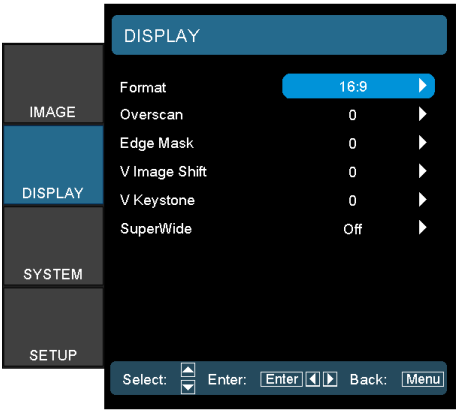
This adjustable item utilizes a new color-processing algorithm and enhancements to enable the picture's vividness to be significantly increased. The range is from "0" to "5".

## PureMotion

PureMotion uses sophisticated algorithms to ensure that the natural motion in the image is preserved.

## PureEngine Demo

This feature enables you to see the difference in the image quality between the raw unprocessed image and the image processed by the PureEngine. Use this mode to check the adjustments that you make to the PureEngine settings.




# Display

## Format

Use this function to choose your desired aspect ratio.

- 4:3: This format is for 4x3 input sources.
- 16:9: This format is for 16x9 input sources, like HDTV and DVD enhanced for Widescreen TV.
- LBX: This format is for non-16x9, letterbox source and for users who use external anamorphic lens to display 2.35:1 aspect ratio using full resolution.

  Detail informations about LBX mode :

  1. Some Letter-Box DVDs are not enhanced for 16x9 TVs. In this situation, the image will not look right when displayed in 16:9 mode.

     In this situation, please try to using the 4:3 mode to view the DVD.

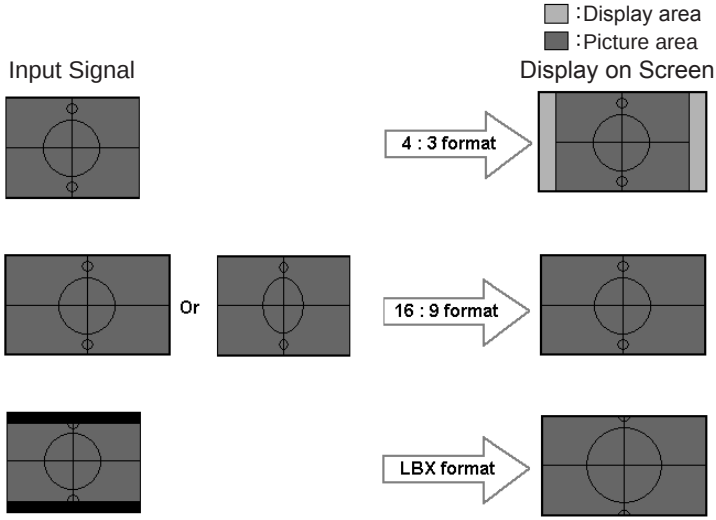
     If the content is not 4:3, there will be black bars around the image in 16:9 display. For this type of content, you can use LBX mode to fill the image on the 16:9 display.
  2. If you use an external anamorphic lens, this LBX mode also allows you to watch a 2.35:1 content (include Anamorphic DVD and HDTV film source) that support anamorphic wide is enhanced for 16x9 Display in a wide 2.35:1 image.

     In this case, there are no black bars. Lamp power and vertical resolution are fully utilized.

Note

When “AUTO235” is enabled for 12v OUT B, display “Format” is set to “Auto235” and cannot be changed.

- Native: This format displays the original image without any scaling.




Note

Each I/O has different settings of “Overscan”.

## Overscan

Overscan function removes the noise in a video image. Overscan the image to remove video encoding noise on the edge of video source.

## Edge Mask

- Press the ◀ to reduce the size of an image.
- Press the ▶ to magnify an image on the projection screen.

## V Image Shift

Shift the projected image position vertically.

## V Keystone

Press the ◀ or ▶ to adjust image distortion vertically and make a squarer image.

## SuperWide

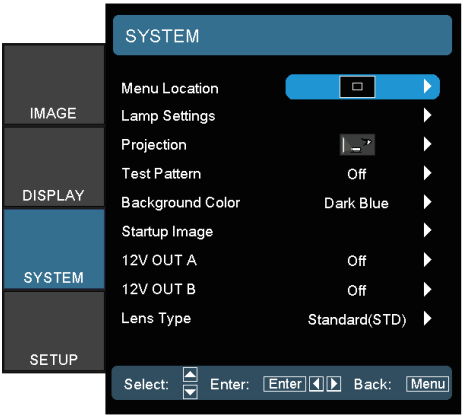
SuperWide is a feature that uses a special 2.0:1 aspect ratio screen enabling both 16:9 and 2.35:1 aspect ratio movies to be shown without black bars at the top and bottom of the screen

- Off: Your desired aspect ratio can be selected - 4:3, 16:9, LBX and Native.
- Auto: To solve the differences of the film formats, the option can keep the format in the same ratio.
- On: a. On (16:9): Fixed 2.0:1 mode for 16:9 content.
  b. On (2.35:1): Fixed 2.0:1 mode for 2.35:1 content.

Note

- "SuperWide" is Off" as default.
- How to use "SuperWide"

1. Obtain a 2.0:1 aspect ratio screen
2. Switch SuperWide ON
3. Align the projector image correctly on the screen
4. Enjoy movies without black bars






# System

## Menu Location

Choose the menu location on the display screen.

## Lamp Settings

Choose this menu to adjust your desired lamp setting.

## Projection

 Front-Projection

This is the default selection. The image is projected straight on the screen.

 Rear-Desktop

When selected, the image will appear reversed.

 Front-Ceiling

When selected, the image will turn upside down.

 Rear-Ceiling

When selected, the image will appear reversed in upside down position.

Note

Rear-Desktop and Rear-Ceiling are to be used with a translucent screen.

## Test Pattern

Display a test pattern. There are Grid, White pattern and None.

## Background Color

Use this feature to display a “Dark Blue”, “Gray”, or “Black” screen when no signal is available.

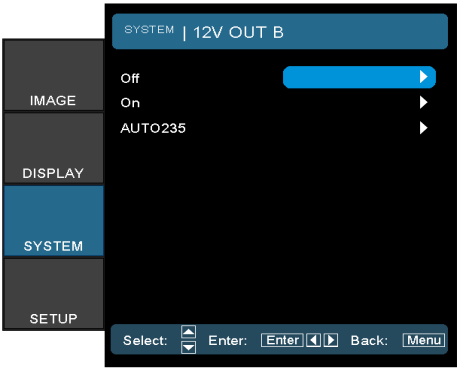
## Startup Image

Select the screen to display during startup.

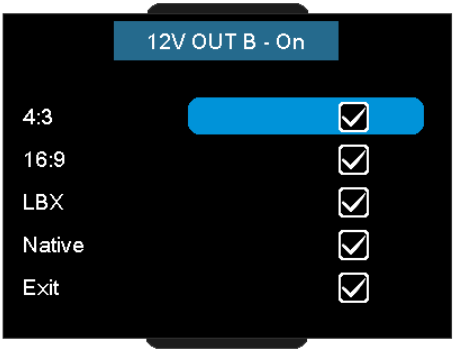
## 12V OUT A

12V OUT A provides a standard DC voltage for motorized screens.

## 12V OUT B




- Off: disables the OUT.
- On: enables the OUT and the programmable sub-menu. The sub-menu is accessed by selecting the ON option then pressing the ENTER button on the remote control. Checking an option in the sub-menu will activate the OUT when the selected display mode is selected. In the example below 16:9 has been selected – this means that OUT B will be active when the projector display mode is set to 16:9. The OUT will be inactive for all the other display mode options.



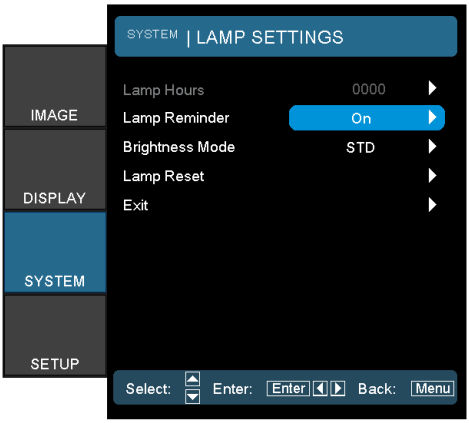
- Auto235: When AUTO235 is enabled the projector will automatically detect when a 2.35:1 ratio presentation is being shown and will activate the trigger on this port which, in turn, can be used to activate a motorised anamorphic lens assembly. The AUTO235 setting and a motorized anamorphic lens assembly can be used in this way to provide a fully automated “Constant Height” projection system.

## Lens Type

Used to set the lens type that has been fitted. This is to ensure correct operation of the lens iris.

Note

First time to turn on the projector:
Remember to select the type of lens you have installed.




# System | Lamp Settings

## Lamp Hour

Display the cumulative lamp operating time.

## Lamp Reminder

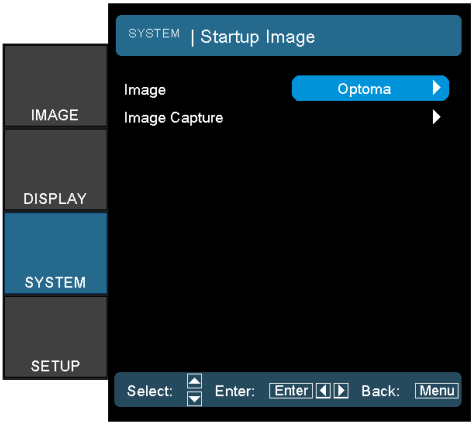
Choose this function to show or to hide the warning message when the changing lamp message is displayed. The message will appear up 30 hours before suggested replacement of lamp.

## Brightness Mode

Choose “Bright” to increase the lamp brightness. Choose “STD” to return to normal mode.

## Lamp Reset

Reset the lamp life hour after replacing the lamp.




# System | Startup Image



## Image

Select the screen to display during startup.

- Default — the supplied default startup screen.
- User — customized screen capture using the Image Capture function.

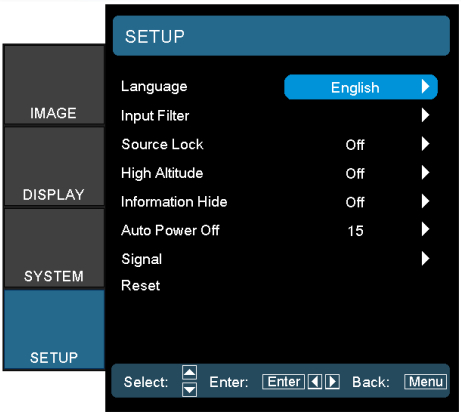
## Image Capture

Capture a displayed screen to use as the startup screen.

1. Display the desired screen on the projector.
2. Select Image Capture from the Advanced menu.
3. Select OK. Screen capture in progress will display.
When finished, Screen capture Succeeded will display.
The captured screen is saved as User in the Image menu.

Note

Startup Capture support in:
HDMI 720p/1080p
VGA 1920X1080@60Hz
YPbPr 720p/1080p



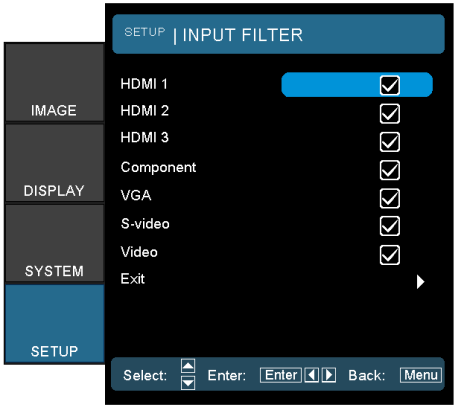

# Setup

## Language

Choose the multilingual OSD menu. Press ◀ or ▶ into the sub menu and then use the ▲ or ▼ key to select your preferred language. Press “Select (Enter)” to finalize the selection.

## Input Filter

Enable the input filter. Press ◀ or ▶ into the next menu as below and then use ▲ or ▼ to select. Press “Select (Enter)” to finalize the selection. The projector will not search inputs that are de-selected.



## Source Lock

When this function is turned off, the projector will search for other signals if the current input signal is lost. When this function is turned on, it will search for a specified connection port.

## High Altitude

Choose “On” to turn on High Altitude mode. Operates the fans at full speed continuously to allow for proper high altitude cooling of the projector.

## Information Hide

Suppress informational messages on the projected screen.

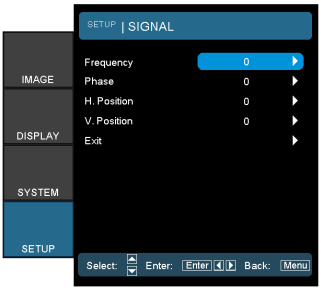
- On: No status messages appear on screen during operation.
- Off: Status messages appear as normal on screen during operation.

## Auto Power Off

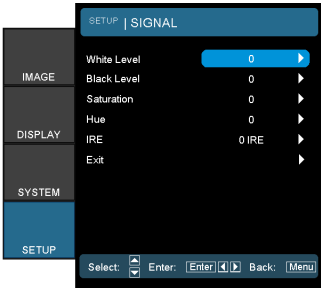
Set the time interval (in minutes) to power off the system if there is no input signal detected.

## Signal

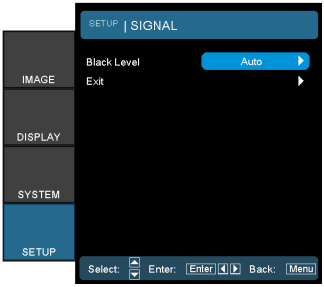
RGB/HDTV Source




Video Source




HDMI Source



- Frequency: Change the display data frequency to match the frequency of your computer's graphic card. When you experience a vertical flickering bar, use this function to make an adjustment.
- Phase: Synchronize the signal timing of the display with the graphics card. If you experience an unstable or flickering image, use this function to correct it.
- H Position: Adjust the horizontal position.
- V Position: Adjust the vertical position.

Note

"IRE" is only supported on NTSC signal.

- White Level : Allow user to adjust White Level when inputting SVideo or Video/CVBS signals.
- Black Level : Allow user to adjust Black Level when inputting SVideo or Video/CVBS signals.
- Saturation : Adjust a video image from black and white to fully saturated color. Press the ◀ to decrease the amount of color in the image. Press the ▶ to increase the amount of color in the image.
- Hue : Adjust the color balance of red and green. Press the ◀ to increase the amount of green in the image. Press the ▶ to increase the amount of red in the image.
- IRE : Adjust measurement of composite video signals.
- Black Level (for HDMI): Allows user to adjust the Black Level for HDMI signals.

## Reset

Return the adjustments and settings to factory default values.

- Current : Return the current menu's settings to factory default.
- All : Return the settings for all menus to factory default values.

# Troubleshooting

*If you experience a problem with your projector, please refer to the following information. If a problem persists, please contact your local reseller or service center.*

## Image Problems

**? No image appears on-screen**

- Ensure all the cables and power connections are correctly and securely connected as described in the “Installation” section.
- Ensure the pins of connectors are not crooked or broken.
- Check if the projection lamp has been securely installed. Please refer to the “Replacing the Lamp” section.
- Make sure you have removed the lens cap and the projector is switched on.

**? Image is out of focus**

- Make sure the Lens cap is removed.
- Adjust the Focus Ring on the projector lens.
- Make sure the projection screen is between the required distance from the projector. See pages 21 and 22.

**? The image is stretched when displaying 16:9 DVD title**

- When you play anamorphic DVD or 16:9 DVD, the projector will show the best image in 16: 9 format on projector side.
- If you play the LBX format DVD title, please change the format as LBX in projector OSD.
- If you play 4:3 format DVD title, please change the format as 4:3 in projector OSD.
- If the image is still stretched, you will also need to adjust the aspect ratio by referring to the following:
- Please setup the display format as 16:9 (wide) aspect ratio type on your DVD player.

### Image is too small or too large

- Adjust the zoom lever from the lens.
- Move the projector closer to or further from the screen.
- Press [Menu] on the projector panel, go to “Display-->Format”. Try the different settings.

### Image has slanted sides:

- If possible, reposition the projector so that it is centered on the screen and below the bottom of the screen and use PureShift to make adjustments to the image position.
- Use “Display-->V Keystone” from the OSD to make an adjustment.

### Image is reversed

- Select “System-->Projection” from the OSD and adjust the projection direction.

## Other Problems

### The projector stops responding to all controls

- If possible, turn off the projector, then unplug the power cord and wait at least 20 seconds before reconnecting power.

### Lamp burns out or makes a popping sound

- When the lamp reaches its end of life, it will burn out and may make a loud popping sound. If this happens, the projector will not turn on until the lamp module has been replaced. To replace the lamp, follow the procedures in the “Replacing the Lamp” section on page 48.

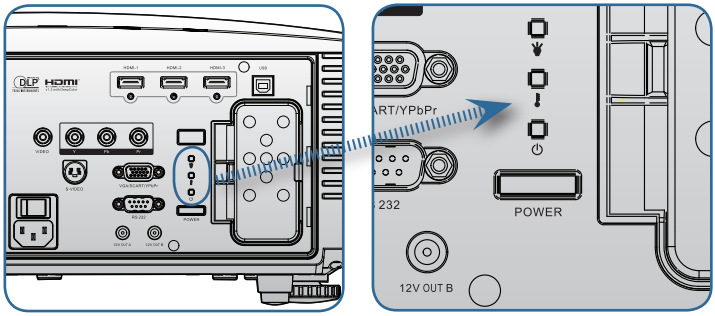
## Projector Status Indication

| Message | Power LED (Blue) | Power LED (Red) | Temp-LED“ (Red) | Lamp-LED (Red) |
|---|---|---|---|---|
| Standby State (Input power cord) | ○ | ☼ | ○ | ○ |
| Standby State (Burn in Mode) | Flashing | ○ | ☼ | ☼ |
| Power on with OSD (Press power button) | * ☼ | ○ | ○ | ○ |
| Power on without OSD | ○ | ○ | ○ | ○ |
| Over Temperature | ☼ | ○ | ☼ | ○ |
| Fan Fail | ☼ | ○ | Flashing | ○ |
| Lamp error | ☼ | ○ | ○ | ☼ |
| Power off (Cooling) | ☼ | ○ | ○ | ○ |

Note

Steady light => ☼
No light => ○

* Power LED will be ON when OSD appears and OFF when OSD disappears.



## LED Error Code Messages

| Error Code Message | Power LED (Blink) | Lamp LED (Blink) |
|---|---|---|
| T1 temperature over temperature | 3 | 0 |
| Thermal Break | 4 | 0 |
| G794 fail | 4 | 4 |
| T1 fail | 4 | 5 |
| Lamp error | 5 | 0 |
| Ballast Over Temperature | 5 | 1 |
| Ballast shot circuit in output detected | 5 | 2 |
| End of lamp lift detected | 5 | 3 |
| Ballast lamp did not ignite | 5 | 4 |
| Lamp extinguished during normal operation | 5 | 5 |
| Lamp extinguished during run-up phase | 5 | 6 |
| Fan1 error (Lamp Fan) | 6 | 1 |
| Fan2 error (Ballast Fan) | 6 | 2 |
| Fan3 error (Burner Fan) | 6 | 3 |
| Fan4 error (Power Fan) | 6 | 4 |
| Lamp door open | 7 | 0 |
| DMD error | 8 | 0 |
| Color wheel error | 9 | 0 |

### LED states

### On Screen Messages

- Fan failed:
  The projector will switch off automatically.




- Over temperature:
  The projector will switch off automatically.




- Replacing the lamp:
  Lamp is approaching the end of its rated life.
  Replacement suggested.




## Remote Control Problems

### If the remote control does not work

- Check the operating angle of the remote control is within ±15° both horizontally and vertically of on of the IR receivers on the projector.
- Make sure there are no any obstructions between the remote control and the projector. Move to within 7 m (23 ft) of the projector.
- Make sure batteries are inserted correctly.
- Replace batteries if they are exhausted.

# Replacing the Lamp

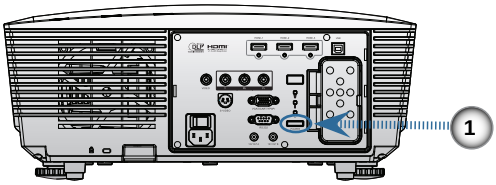
*The projector automatically detects the lamp life. When the lamp life is nearing the end of use, you will receive a warning message.*

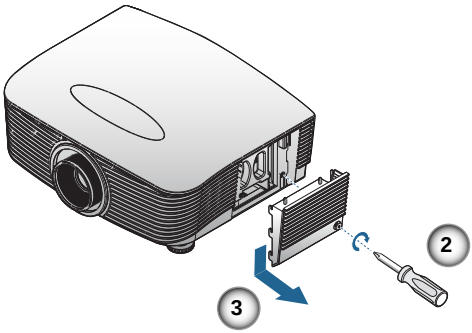


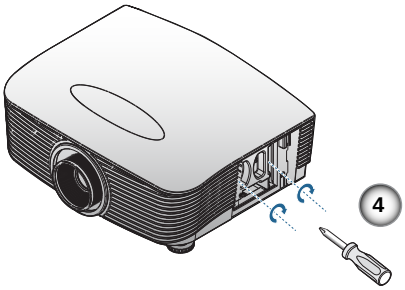

*When you see this message, please contact your local reseller or service center to change the lamp as soon as possible. Make sure the projector has been cooled down for at least 30 minutes before changing the lamp.*

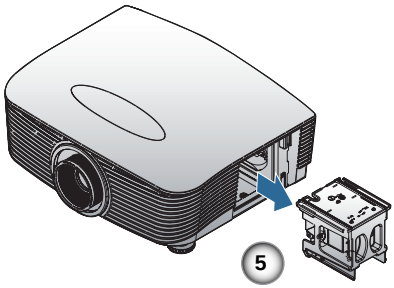
Warning: Lamp compartment is hot! Allow it to cool down before changing lamp!

Warning: To reduce the risk of personal injury, do not drop the lamp module or touch the lamp bulb. The bulb may shatter and cause injury if it is dropped.


1


2
3


4


5

**Lamp Replacing Procedure:**

1. Switch off the power to the projector by pressing the Power button.
2. Allow the projector to cool down at least 30 minutes. ❶
3. Disconnect the power cord.
4. Unlock the lamp cover. ❷
5. Pull up and remove the cover. ❸
6. Use a screwdriver to remove the screws from the lamp module. ❹
7. Pull out the lamp module. ❺

**To replace the lamp module, reverse the previous steps.**

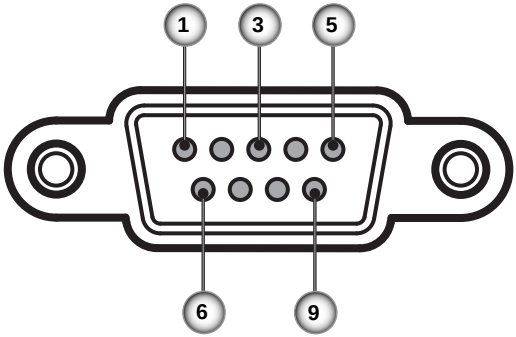
8. Turn on the projector and do “Lamp Reset” after the lamp module is replaced.
   Lamp Reset: (i)Press “Menu” -> (ii)Select “System” -> (iii)Select “Lamp Settings” ->(iv)Select “Lamp Reset” -> (v)Select “Yes”.

# Compatibility Modes

| Mode | Resolution | V.Frequency (Hz) | Analog | Digital |
|---|---|---|---|---|
| SVGA | 800 x 600 | 56 | ✓ | × |
| | 800 x 600 | 60 | ✓ | ✓ |
| | 800 x 600 | 72 | ✓ | ✓ |
| | 800 x 600 | 75 | ✓ | ✓ |
| | 800 x 600 | 85 | ✓ | ✓ |
| XGA | 1024 x 768 | 60 | ✓ | ✓ |
| | 1024 x 768 | 70 | ✓ | ✓ |
| | 1024 x 768 | 75 | ✓ | ✓ |
| | 1024 x 768 | 85 | ✓ | × |
| WXGA | 1280 x 768 | 60 | ✓ | ✓ |
| | 1280 x 800 | 60 | ✓ | × |
| HD | 1280 x 720 | 60 | ✓ | ✓ |
| | 1280 x 1024 | 60 | ✓ | ✓ |
| | 1280 x 1024 | 75 | ✓ | ✓ |
| | 1920 x 1080 | 24 | × | ✓ |
| | 1920 x 1080 | 60 | × | ✓ |
| SXGA+ | 1400 x 1050 | 60 | ✓ | ✓ |
| UXGA | 1600 x 1200 | 60 | ✓ | ✓ |
| Power Book G4 | | | | |
| SVGA | 800 x 600 | 60 | ✓ | × |
| | 800 x 600 | 75 | ✓ | × |
| | 800 x 600 | 85 | ✓ | × |
| XGA | 1024 x 768 | 60 | ✓ | × |
| | 1024 x 768 | 70 | ✓ | × |
| | 1024 x 768 | 75 | ✓ | × |
| | 1024 x 768 | 85 | ✓ | × |
| WXGA | 1280 x 768 | 60 | ✓ | × |
| HD | 1280 x 720 | 60 | ✓ | × |
| | 1280 x 1024 | 60 | ✓ | × |
| | 1280 x 1024 | 75 | ✓ | × |
| SXGA+ | 1400 x 1050 | 60 | ✓ | × |
| UXGA | 1600 x 1200 | 60 | ✓ | × |
| iMAC | | | | |
| XGA | 1024 x 768 | 60 | ✓ | × |

# RS232 Commands and Protocol Function List

## RS232 Pin Assignments




| Pin no. | Name | I/O (From Projector Side) |
|---|---|---|
| 1 | NC | __ |
| 2 | RXD | IN |
| 3 | TXD | OUT |
| 4 | NC | __ |
| 5 | NC | __ |
| 6 | NC | __ |
| 7 | RS232 | RTS |
| 8 | RS232 | CTS |
| 9 | NC | __ |

# RS232 Protocol Function List



## HD86 RS232 Command Table.

Baud Rate : 9600
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control : None
UART16550 FIFO: Disable
Projector Return (Pass): P
Projector Return (Fail): F

XX=01-99, projector's ID, XX=00 is for all projectors

**SEND to projector**

**Note : There is a <CR> after all ASCII commands**
**0D is the HEX code for <CR> in ASCII code**

| 232 ASCII Code | HEX Code | Function | | Description |
|---|---|---|---|---|
| ~XX00 1 | 7E 30 30 30 30 20 31 0D | Power ON | | |
| ~XX00 2 | 7E 30 30 30 30 20 32 0D | Power OFF | | |
| ~XX01 1 | 7E 30 30 30 31 20 31 0D | Resync | | |
| ~XX12 1 | 7E 30 30 31 32 20 31 0D | | HDMI 1 | |
| ~XX12 15 | 7E 30 30 31 32 20 31 35 0D | | HDMI 2 | |
| ~XX12 16 | 7E 30 30 31 32 20 31 36 0D | | HDMI 3 | |
| ~XX12 14 | 7E 30 30 31 32 20 31 34 0D | | Component YPbPr | |
| ~XX12 5 | 7E 30 30 31 32 20 35 0D | | VGA | |
| ~XX12 7 | 7E 30 30 31 32 20 37 0D | Direct Source Selection | VGA SCART | |
| ~XX12 8 | 7E 30 30 31 32 20 38 0D | | VGA Component | |
| ~XX12 9 | 7E 30 30 31 32 20 39 0D | | S-video | |
| ~XX12 10 | 7E 30 30 31 32 20 31 30 0D | | Video | |
| ~XX20 1 | 7E 30 30 32 30 20 31 0D | Display Mode | Cinema 1 | |
| ~XX20 9 | | | Cinema 2 | |
| ~XX20 2 | 7E 30 30 32 30 20 32 0D | | Bright | |
| ~XX20 3 | 7E 30 30 32 30 20 33 0D | | Photo | |
| ~XX20 4 | 7E 30 30 32 30 20 34 0D | | Reference | |
| ~XX20 10 | | | Graphics | |
| ~XX20 5 | 7E 30 30 32 30 20 35 0D | | User | |
| ~XX20 6 | 7E 30 30 32 30 20 36 0D | | ISFDay | |
| ~XX20 7 | 7E 30 30 32 30 20 37 0D | | ISFNight | |
| ~XX21 n | 7E 30 30 32 31 20 a 0D | Brightness | | n= 0 (a=30) - +100 (a=31 30 30) |
| ~XX22 n | 7E 30 30 32 32 20 a 0D | Contrast | | n= 0 (a=30) - +100 (a=31 30 30) |
| ~XX23 n | 7E 30 30 32 33 20 a 0D | Sharpness | | n= 1 (a=31) - +15 (a=31 35) |
| ~XX44 n | 7E 30 30 34 34 20 a 0D | Color | | n= 0 (a=30) - +100 (a=31 30 30) |
| ~XX45 n | 7E 30 30 34 35 20 a 0D | Tint | | n= 0 (a=30) - +100 (a=31 30 30) |
| ~XX196 n | 7E 30 30 31 39 36 20 a 0D | Image/Advanced | Noise Reduction | n= 0 (a=30) - 10 (a=31 30) |
| ~XX35 1 | 7E 30 30 33 35 20 31 0D | Image/Advanced/Gamma | Film | |
| ~XX182 n | 7E 30 30 31 38 32 20 a 0D | | Curve Type | n=-7 (a=2D 37) - +7 (a=37) |
| ~XX183 n | 7E 30 30 31 38 33 20 a 0D | | Offset | n=-5 (a=2D 35) - +5 (a=35) |
| ~XX35 2 | 7E 30 30 33 35 20 32 0D | | Video | |
| ~XX184 n | 7E 30 30 31 38 34 20 a 0D | | Curve Type | n=-7 (a=2D 37) - +7 (a=37) |
| ~XX185 n | 7E 30 30 31 38 35 20 a 0D | | Offset | n=-5 (a=2D 35) - +5 (a=35) |
| ~XX35 3 | 7E 30 30 33 35 20 33 0D | | Graphics | |
| ~XX186 n | 7E 30 30 31 38 36 20 a 0D | | Curve Type | n=-7 (a=2D 37) - +7 (a=37) |
| ~XX187 n | 7E 30 30 31 38 37 20 a 0D | | Offset | n=-5 (a=2D 35) - +5 (a=35) |
| ~XX35 4 | 7E 30 30 33 35 20 34 0D | | Standard | |
| ~XX188 n | 7E 30 30 31 38 38 20 a 0D | | Curve Type | n=-7 (a=2D 37) - +7 (a=37) |
| ~XX189 n | 7E 30 30 31 38 39 20 a 0D | | Offset | n=-5 (a=2D 35) - +5 (a=35) |
| ~XX41 n | 7E 30 30 34 31 20 a 0D | Image/Advanced/PureEngine | PureDetail | n=Off/1/2/3 (a=30/31/32/33) |
| ~XX42 n | 7E 30 30 34 32 20 a 0D | | PureColour | n=Off/1/2/3/4/5 (a=30/31/32/33/34/35) |
| ~XX190 n | 7E 30 30 31 39 30 20 a 0D | | PureMotion | n=Off/Low/Med/High (a=30/31/32/33/34) |
| ~XX197 n | 7E 30 30 31 39 37 20 a 0D | | Pure Demo | n=Off/H Split/V Split=0/1/2 (a=30/31/32) |
| ~XX191 n | 7E 30 30 31 39 31 20 a 0D | DynamicBlack | | n=Off/Cinema 1/Cinema 2=1(a=30/31/32) |
| ~XX210 n | 7E 30 30 33 36 20 31 0D | Color Temp. | D50/D65/ /D75/D83/D93/Native | n=1/2/3/4/5/6 (a=30/31/32/33/34/35) |
| ~XX211 n | | Color Gamut | Native/DLP/HDTV/EBU/SMPTE-C | n=Off/1/2/3/4/5 (a=30/31/32/33/34/35) |
| ~XX212 n | | CMS | R/G/B/C/Y/M | (a=30/31/32/33/34/35/36) |
| ~XX213 n | | | X Offset | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX214 n | | | Y Offset | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX24 n | 7E 30 30 32 34 20 a 0D | RGB Gain\Bias | Red Gain | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX25 n | 7E 30 30 32 35 20 a 0D | | Green Gain | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX26 n | 7E 30 30 32 36 20 a 0D | | Blue Gain | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX27 n | 7E 30 30 32 37 20 a 0D | | Red Bias | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX28 n | 7E 30 30 32 38 20 a 0D | | Green Bias | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX29 n | 7E 30 30 32 39 20 a 0D | | Blue Bias | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX37 n | 7E 30 30 33 37 20 32 0D | Color Space | AUTO/RGB/YUV(YCbCr) | n=1/2/3 (a=30/31/32) |
| ~XX60 1 | 7E 30 30 36 30 20 31 0D | Format | 4:3 | |
| ~XX60 2 | 7E 30 30 36 30 20 32 0D | | 16:9 | |
| ~XX60 5 | 7E 30 30 36 30 20 35 0D | | LBX | |
| ~XX60 6 | 7E 30 30 36 30 20 36 0D | | Native | |
| ~XX60 8 | 7E 30 30 36 30 20 38 0D | | AUTO235 | |
| ~XX60 9 | 7E 30 30 36 30 20 39 0D | | SuperWide | |
| ~XX60 7 | 7E 30 30 36 30 20 37 0D | | AUTO | |

| | | | | |
|---|---|---|---|---|
| ~XX61 n | 7E 30 30 36 31 20 a 0D | Overscan | | n= 0 (a=30) – 4 (a=34) |
| ~XX62 n | 7E 30 30 36 32 20 a 0D | Edge masking | | n=0 (a=30) -5 (a=35) |
| ~XX64 n | 7E 30 30 36 34 20 a 0D | V Image Shift | | n= -50 (a=2D 35 30) - +50 (a=35 30) |
| ~XX66 n | 7E 30 30 36 36 20 a 0D | V Keystone | | n= -30 (a=2D 33 30) - +30 (a=33 30) |
| ~XX72 1 | 7E 30 30 37 32 20 31 0D | Menu Location | Top Left | |
| ~XX72 2 | 7E 30 30 37 32 20 32 0D | | Top Right | |
| ~XX72 3 | 7E 30 30 37 32 20 33 0D | | Center | |
| ~XX72 4 | 7E 30 30 37 32 20 34 0D | | Bottom Left | |
| ~XX72 5 | 7E 30 30 37 32 20 35 0D | | Bottom Right | |
| ~XX108 1 | 7E 30 30 31 30 38 20 31 0D | Lamp Setting | Lamp Hour | |
| ~XX109 1 | 7E 30 30 31 30 39 20 31 0D | | Lamp Reminder | On |
| ~XX109 2 | 7E 30 30 31 30 39 20 32 0D | | | Off |
| ~XX110 1 | 7E 30 30 31 31 30 20 31 0D | | Brite Mode | On |
| ~XX110 2 | 7E 30 30 31 31 30 20 32 0D | | | Off |
| ~XX111 1 | 7E 30 30 31 31 31 20 31 0D | | Lamp Reset | Yes |
| ~XX111 2 | 7E 30 30 31 31 31 20 32 0D | | | No |
| ~XX71 1 | 7E 30 30 37 31 20 31 0D | Projection | Front-Desktop | |
| ~XX71 2 | 7E 30 30 37 31 20 32 0D | | Rear-Desktop | |
| ~XX71 3 | 7E 30 30 37 31 20 33 0D | | Front-Ceiling | |
| ~XX71 4 | 7E 30 30 37 31 20 34 0D | | Rear-Ceiling | |
| ~XX70 1 | 7E 30 30 37 30 20 31 0D | Language | English | |
| ~XX70 2 | 7E 30 30 37 30 20 32 0D | | German | |
| ~XX70 3 | 7E 30 30 37 30 20 33 0D | | French | |
| ~XX70 4 | 7E 30 30 37 30 20 34 0D | | Italian | |
| ~XX70 5 | 7E 30 30 37 30 20 35 0D | | Spanish | |
| ~XX70 6 | 7E 30 30 37 30 20 36 0D | | Portuguese | |
| ~XX70 7 | 7E 30 30 37 30 20 37 0D | | Polish | |
| ~XX70 8 | 7E 30 30 37 30 20 38 0D | | Dutch | |
| ~XX70 9 | 7E 30 30 37 30 20 39 0D | | Swedish | |
| ~XX70 10 | 7E 30 30 37 30 20 31 30 0D | | Norwegian/Danish | |
| ~XX70 11 | 7E 30 30 37 30 20 31 31 0D | | Finnish | |
| ~XX70 12 | 7E 30 30 37 30 20 31 32 0D | | Greek | |
| ~XX70 13 | 7E 30 30 37 30 20 31 33 0D | | Traditional Chinese | |
| ~XX70 14 | 7E 30 30 37 30 20 31 34 0D | | Simplified Chinese | |
| ~XX70 15 | 7E 30 30 37 30 20 31 35 0D | | Japanese | |
| ~XX70 16 | 7E 30 30 37 30 20 31 36 0D | | Korean | |
| ~XX70 17 | 7E 30 30 37 30 20 31 37 0D | | Russian | |
| ~XX70 18 | 7E 30 30 37 30 20 31 38 0D | | Hungarian | |
| ~XX70 19 | 7E 30 30 37 30 20 31 39 0D | | Czechoslovak | |
| ~XX70 20 | 7E 30 30 37 30 20 32 30 0D | | Arabic | |
| ~XX70 21 | 7E 30 30 37 30 20 32 31 0D | | Thai | |
| ~XX70 22 | 7E 30 30 37 30 20 32 32 0D | | Turkish | |
| ~XX39 1 | 7E 30 30 33 39 20 31 0D | Input Source Filters | HDMI 1 | |
| ~XX39 7 | 7E 30 30 33 39 20 37 0D | | HDMI 2 | |
| ~XX39 12 | 7E 30 30 33 39 20 31 32 0D | | HDMI 3 | |
| ~XX39 8 | 7E 30 30 33 39 20 38 0D | | Component | |
| ~XX39 5 | 7E 30 30 33 39 20 35 0D | | VGA | |
| ~XX39 9 | 7E 30 30 33 39 20 39 0D | | S-Video | |
| ~XX39 10 | 7E 30 30 33 39 20 31 30 0D | | Video | |
| ~XX100 1 | 7E 30 30 31 30 30 20 31 0D | Source Lock | On | |
| ~XX100 2 | 7E 30 30 31 30 30 20 32 0D | | Off | |
| ~XX106 n | 7E 30 30 31 30 36 20 a 0D | | Auto Power Off (min) | n=0 (a=30)-60 (a=36 30) (multiple of 5) |
| ~XX73 n | 7E 30 30 37 33 20 a 0D | Signal | Tracking (Frequency) | n= 0 (a=30) –200 (a=32 30 30) |
| ~XX74 n | 7E 30 30 37 34 20 a 0D | | Phase | n= 0 (a=30) – 100 (a=31 30 30) |
| ~XX75 n | 7E 30 30 37 35 20 a 0D | | H. Position | n= 0 (a=30) – 100 (a=31 30 30) |
| ~XX76 n | 7E 30 30 37 36 20 a 0D | | V. Position | n= 0 (a=30) – 100 (a=31 30 30) |
| ~XX200 n | 7E 30 30 32 30 30 20 a 0D | | Black Level | n=0 (a=30) -100 (a=31 30 30) |
| ~XX201 n | 7E 30 30 32 30 31 20 a 0D | | White Level | n=0 (a=30) -100 (a=31 30 30) |
| ~XX202 n | 7E 30 30 32 30 32 20 a 0D | | Saturation | n= 0 (a=30) – 100 (a=31 30 30) |
| ~XX203 n | 7E 30 30 32 30 33 20 a 0D | | Hue | n= 0 (a=30) – 100 (a=31 30 30) |
| ~XX204 n | 7E 30 30 32 30 34 20 a 0D | | IRE | n=0/7.5 (a=30/31) |
| ~XX217 1 | | HDMI Black Level | YCbCr | |
| ~XX217 2 | | | RGB | |
| ~XX217 3 | | | AUTO | |

Remote Control Emulation

| | | | | |
|---|---|---|---|---|
| ~XX140 n | 7E 30 30 31 34 20 a 0D | | | |
| | | | Up | n=10 |
| | | | Left | n=11 |
| | | | Enter | n=12 |
| | | | Right | n=13 |
| | | | Down | n=14 |
| | | | Menu | n=20 |
| | | | Re-sync | n=28 |

**SEND from projector automatically**

| 232 ASCII Code | HEX Code | Function | Projector Return | Description |
|---|---|---|---|---|
| when Standby/Warming/Cooling/Out of Range/Lamp fail | | | INFOn | n : 0/1/2/3/4 = Standby/Warming/Cooling/Lamp fail |

**READ from projector**

| 232 ASCII Code | HEX Code | Function | Projector Return | Description |
|---|---|---|---|---|
| ~XX121 1 | 7E 30 30 31 32 31 20 31 0D | Input Source Commands | OKn | n: 0/1/2/3/4/5/6/7/8<br>= None/HDMI 1/HDMI 2/DVI/Component/VGA/S-Video/Video |
| ~XX122 1 | 7E 30 30 31 32 32 20 31 0D | Software Version | OKaaaa | |
| ~XX123 1 | 7E 30 30 31 32 33 20 31 0D | Display Mode | OKn | n: 0/1/2/3/4/5/6/7/8/9<br>= Cinema 1/Cinema 2/Bright/ Photo/ Reference/Graphics/User 1/ ISF Day /ISF Night |
| ~XX124 1 | 7E 30 30 31 32 34 20 31 0D | Power State | OKn | n: 0/1=Off/On |
| ~XX125 1 | 7E 30 30 31 32 35 20 31 0D | Brightness | OKn | |
| ~XX126 1 | 7E 30 30 31 32 36 20 31 0D | Contrast | OKn | |
| ~XX127 1 | 7E 30 30 31 32 37 20 31 0D | Aspect Ratio | OKn | n: 0/1/2/3/4/5/6<br>=4:3, 16:9, LBX, Native, AUTO235, SuperWide, AUTO |
| ~XX128 1 | 7E 30 30 31 32 38 20 31 0D | Color Temperature | OKn | n: 0/1/2/4/5/6/7/8 =Warm/Medium/Cold/D50/D65/D75/D83/D93/Native |
| ~XX129 1 | 7E 30 30 31 32 39 20 31 0D | Projection Mode | OKn | n: 0/1/2/3<br>=Front-Desktop/Rear-Desktop/Front-Ceiling/Rear-Ceiling |
| ~XX150 1 | 7E 30 30 31 35 30 20 31 0D | Information | OKabbbbcddddde | a : 0/1=Off/On<br>bbbb: Lamp Hour<br>c: source 0/1/2/3/4/5/6/7<br>= None/HDMI 1/HDMI 2/DVI/Component/VGA/S-Video/Video<br>dddd: FW version<br>e : Display mode 0/1/2/3/4/5/7/8/9<br>= Cinema 1/Cinema 2/Bright/ Photo/ Reference/Graphics/User 1/ ISF Day /ISF Night |
| ~XX151 1 | 7E 30 30 31 35 31 20 31 0D | Model Name | OKn | n : 0/1/2/3=HD82/HD82LV/HD86 |
| ~XX152 1 | 7E 30 30 31 35 32 20 31 0D | RS232 Version No | OKn | |

# Ceiling Mount Installation

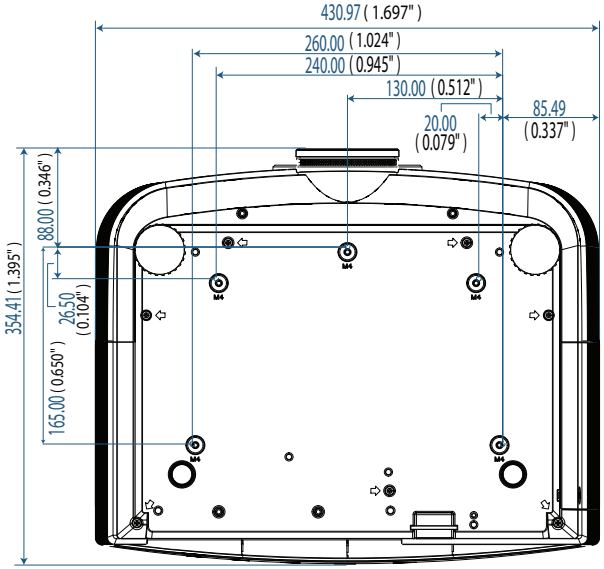
1. To prevent damage to your projector, please use the Optoma ceiling mount.
2. If you wish to use a third party ceiling mount kit, please ensure the screws used to attached a mount to the projector met the following specifications:
   - **Screw type: M4**
   - **Maximum screw length: 11mm**
   - **Minimum screw length: 9mm**

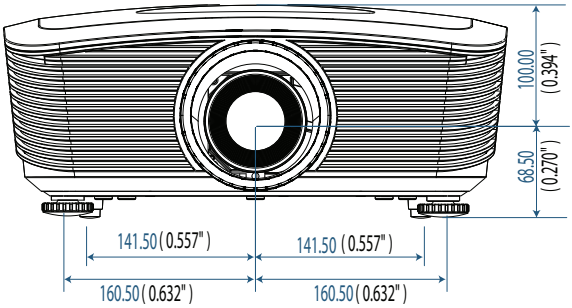
Note

Please note that damage resulting from incorrect installation will invalidate the warranty.

Warning:

1. If you buy ceiling mount from other company, please be sure to use the correct screw size. Screw size will be different on different mounts. It depends on the plate thickness.
2. Be sure to keep at least 10cm gap between the ceiling and the bottom of the projector.
3. Avoid installing the projector near a heat source.



# Optoma Global Offices

*For service or support please contact your local office.*

## USA

715 Sycamore Drive
Milpitas, CA 95035, USA
www.optomausa.com

Tel : 408-383-3700
Fax: 408-383-3702
Service : services@optoma.com

## Canada

5630 Kennedy Road, Mississauga,
ON, L4Z 2A9, Canada
www.optoma.ca

Tel : 905-361-2582
Fax: 905-361-2581
Service : canadacsragent@optoma.com

## Europe

42 Caxton Way, The Watford Business Park
Watford, Hertfordshire,
WD18 8QZ, UK
www.optoma.eu
Service Tel : +44 (0)1923 691865

Tel : +44 (0) 1923 691 800
Fax: +44 (0) 1923 691 888
Service : service@tsc-europe.com

## France

Bâtiment E
81-83 avenue Edouard Vaillant
92100 Boulogne Billancourt, France

Tel : +33 1 41 46 12 20
Fax: +33 1 41 46 94 35
Service : savoptoma@optoma.fr

## Spain

C/ José Hierro,36 Of. 1C
28529 Rivas VaciaMadrid,
Spain

Tel : +34 91 499 06 06
Fax: +34 91 670 08 32

## Deutschland

Werftstrasse 25
D40549 Düsseldorf,
Germany

Tel : +49 (0) 211 506 6670
Fax: +49 (0) 211 506 66799
Service : info@optoma.de

## Scandinavia

Grev Wedels Plass 2
3015 Drammen
Norway

Tel : +47 32 26 89 90
Fax: +47 32 83 78 98
Service : info@optoma.de

## Latin America

715 Sycamore Drive
Milpitas, CA 95035, USA
www.optoma.com.br

Tel : 408-383-3700
Fax: 408-383-3702
www.optoma.com.mx

## Taiwan

231,台北縣新店市民權路108號5樓

電話：+886-2-2218-2360　　傳真：+886-2-2218-2313

服務處：services@optoma.com.tw　　www.optoma.com.tw

asia.optoma.com

## Hong Kong

Unit A, 27/F Dragon Centre, 79 Wing Hong Street,

Cheung Sha Wan Kowloon, Hong Kong

Tel : +852-2396-8968　　Fax: +852-2370-1222

www.optoma.com.hk

## China

上海市长宁区凯旋路1205号5楼　　电话：+86-21-62947376

邮编: 200052　　传真：+86-21-62947375

www.optoma.com.cn

## Japan

東京都足立区綾瀬 3-25-18　　サポートセンター:0120-46-5040

株式会社オーエスエム

E-Mail: info@osscreen.com　　http://www.os-worldwide.com/

## Korea

WOOMI TECH.CO.,LTD.

4F, Minu Bldg.33-14, Nonhyun-Dong,　　Tel : +82+2+34430004

Kangnam-Ku, seoul, 135-815, KO-REA　　Fax: +82+2+34430005

# Regulation & Safety Notices

*This appendix lists the general notices of your Projector.*

## FCC notice

This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

### Notice: Shielded cables

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

### Caution

Changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by the Federal Communications Commission, to operate this projector.

## Operation conditions

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation.

## Notice: Canadian users

This Class B digital apparatus complies with Canadian ICES-003.

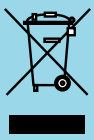
## Remarque à l'intention des utilisateurs canadiens

Cet appareil numerique de la classe B est conforme a la norme NMB-003 du Canada.

## Declaration of Conformity for EU countries

- EMC Directive 2004/108/EC (including amendments)
- Low Voltage Directive 2006/95/EC
- R & TTE Directive 1999/5/EC
  (if product has RF function)

## Disposal instructions



**Do not throw this electronic device into the trash when discarding. To minimize pollution and ensure utmost protection of the global environment, please recycle it.**