





FIXED LENS INSTALLATION GUIDE 	 Phoenix	 Paladin	 Paladin DCR
Patented cylindrical-prism technology	1.33x Horizontal Expansion	0.75x Vertical Compression	0.80x Vertical compression
Throw distance range	12' – 24' (3.6m – 7.3m)	12' to 36' (3.6m – 11m)	12' to 36' (3.6m – 11m)
Min throw distance	1.6 x screen width	1.6 x screen width	1.4 x screen width
Vertical projector position	Any screen height +/- 15% of screen height	Top or bottom of screen +/- 15% of screen height	Top or bottom of screen +/- 15% of screen height
Horizontal projector position	Centered with minimal or no horizontal lens shift	Centered with minimal or no horizontal lens shift	Centered with minimal or no horizontal lens shift
Mounting orientation	Suspended (preferred) or shelf mount	Suspended (preferred) or shelf mount	Suspended (preferred) or shelf mount
Max edge distortion (at lowest throw ratio)	0.005 x screen diag. at 1.6:1 UW throw ratio	0.005 x screen diag. at 1.6:1 UW throw ratio	0.005 x screen diag. at 1.4:1 UW throw ratio
Electronic Convergence Correction (Sony, Epson and JVC HT projectors)	Recommended for throw distance / screen width ratio under 2.2:1	Unnecessary	Unnecessary
Optimum screen aspect ratio	2.4:1 flat or curved	2.4:1 flat (adjustment for 2.35:1)	2.4:1 flat (adjustment for 2.35:1)
Attachment kit	Panamorph standard bracket with XM2 or XMU kit included	Panamorph standard bracket with XM2 or XMU kit included	Panamorph standard bracket with XM2 or XMU kit included
Projector resolutions supported	Up to 4K (UHD) in the 16:9 format	4K (UHD) up to 8K in the 16:9 format	4K (4096) to 8K in the 17:9 cinema format
UltraWide UHD movie enhancement vs. native letterbox	20% increase in brightness from 2+ million more pixels	29% increase in brightness from 2+ million more pixels	38% increase in brightness from 2.5+ million more pixels
Mode I required for UltraWide UHD movies	4/3 vertical stretch	4/3 vertical stretch	4/3 vertical stretch + 16/15 horizontal stretch
Mode II required for 16:9 and 1.85:1 UHD movies in native format in center of screen	3/4 horizontal squeeze	3/4 horizontal squeeze	4/5 horizontal squeeze
Mode for stretching smaller content to fit 2.4:1 screen	"off" or "normal" mode (no anamorphic conversion)	"off" or "normal" mode (no anamorphic conversion)	16:15 horizontal stretch
Size (lens only)	5.1" W x 4.5" H x 5.8" D (129 x 114 x 146 mm)	6.5" W x 5.7" H x 4.5" D (165 x 145 x 114mm)	6.5" W x 5.7" H x 4.13" D (165 x 145 x 105mm)
Weight (lens + bracket)	2.8 pounds (1.3 Kg)	3.6 pounds (1.63 Kg)	3.6 pounds (1.63 Kg)
Warranty	Two years	Two years	Two years

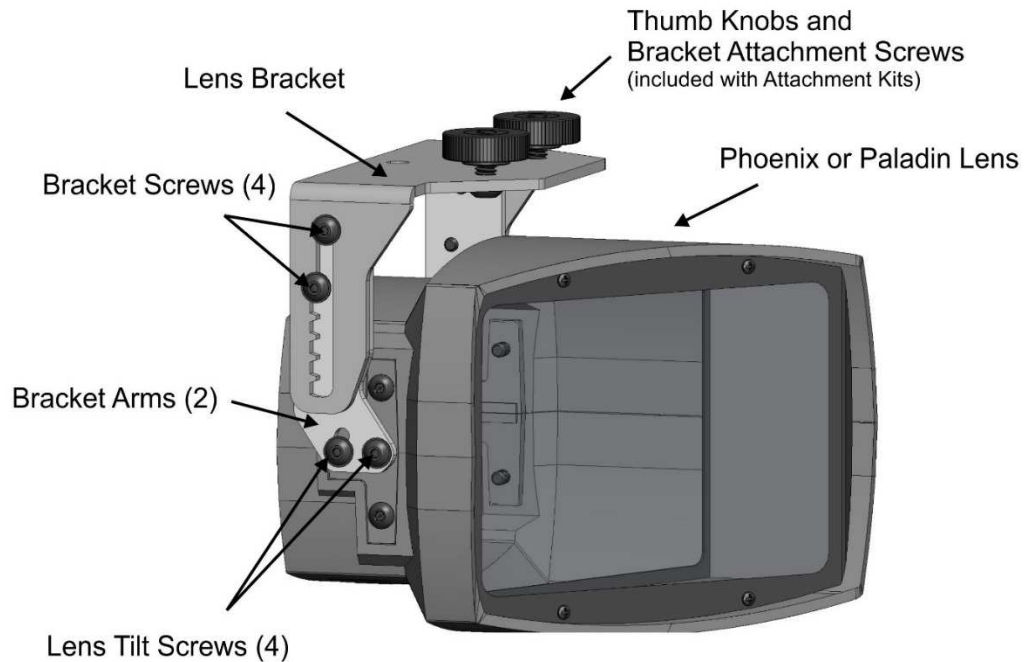
BEFORE LENS INSTALLATION (please read!)

1. **Install the Attachment Kit.** This is the XM2 or XMU Attachment Kit with hardware and instructions that are packaged with your Panamorph lens system.
2. **Fine tune your projection system now.** The projector should be horizontally centered on the screen and pointing at the screen center with roll, tilt and yaw adjusted so that test pattern lines are as perpendicular or parallel with the screen edges as possible. **Do not try to make these adjustments later with the anamorphic lens installed.**
3. **Use an actual 2.4:1 movie for lens installation and set the projector (or processor) to the vertical stretch mode.** Projector test patterns do not typically represent actual movie aspect ratios so set your theater up with a real movie. Most UltraWide movies since 1971 are in the 2.4:1 (or 2.39:1) aspect ratio but check the back of a Blu-ray movie container to make sure. If using the Paladin DCR with a full 4096 projector make sure the anamorphic setting is for the 1.25x, 1.24x (Sony), 0.8X or 4096 mode.
4. Before installing a **Paladin Lens**, adjust the projector zoom so you can see the **left and right edges** of the 2.4:1 movie on the screen slightly inside the screen border. For a 2.4:1 screen adjust the projector's vertical lens shift to provide about 80% of the overscan above the screen and about 20% below. For a 2.35:1 screen adjust the vertical lens shift for about the same overscan above and below. Before installing a **Phoenix Lens**, adjust the projector zoom (with vertical lens shift adjustment as needed) so you can see the **top and bottom edges** of the 2.4:1 movie on the screen slightly inside the screen border.

INSTALLING THE LENS

1. Find the Lens Bracket which is typically shipped in the Kit Parts box separate from the Lens. Please leave the protective film on the lens for now.
2. From the Attachment Kit, insert the two 3/4" Bracket Attachment Screws up through the Lens Bracket and tighten using the included driver (see figure below).

OPTIONAL FOR LARGER PROJECTORS: Instead of the 3/4" screws, use the larger Bracket Attachment Screws with the Bracket Attachment Spacers if you determine or desire that the Lens should vertically extend farther from the Attachment Plate to properly position it in the projector beam. You may wish to preview step 5 below to get a feel for this vertical positioning to determine the appropriate Attachment Screws and Spacers for your projection system. Note that ceiling mounted projectors project the beam out of the lower area of the projection lens so the Panamorph lens will also be aligned lower than the projection lens to properly pass the beam.

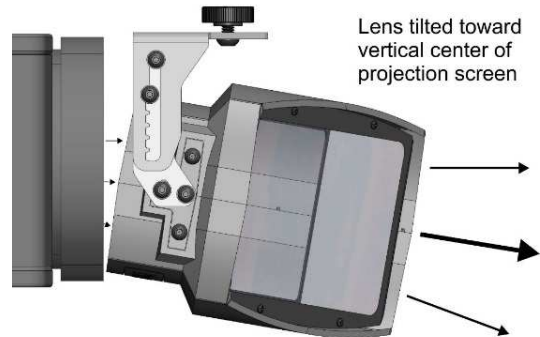


3. Attach the Lens to the Lens Bracket by inserting the four #8-32 Bracket Screws (two on each side) through the toothed Lens Bracket height-adjustment slots and into the Bracket Arms. See the “Other Tips” section for inverting the Lens Bracket. **NOTE: If the projector is toward the top of the screen the Paladin lens should have the Panamorph logo facing down and if at the bottom of the screen the logo should be facing up.**
4. Refer to instruction illustrations for your particular Attachment Kit. Attach the Lens Bracket (now with Lens attached) to the Attachment Plate by directing the Bracket Attachment Screws (now in the Lens Bracket) up through the slotted holes (XM2) or the horizontal slot (XMU) and secure using the two Thumb Knobs. **NOTE:** If the longer Bracket Attachment Screws are used then the Bracket Attachment Spacer(s) should be between the Lens Bracket and the Attachment Plate. If using the XMU Plate, loosen the Thumb Knobs and slide the Lens Bracket horizontally in the slot to center the Lens in front of the projector lens before retightening the Thumb Knobs.
5. Remove the protective film from the Lens. Turn on the projector, show a 2.4:1 movie and make adjustments to the lens so the beam passes through onto the screen unobstructed. Height adjustments are made by slightly loosening the two Bracket Screws on each side and then tilting and vertically moving the Bracket Arms attached to the Lens to an appropriate notch in the toothed slots where the Bracket Arms can settle to align with the sides of the Lens Bracket. Tilt adjustments are made by slightly loosening the two Lens Tilt screws on each side connecting the Bracket Arms to the Lens so that it pivots about the front screw. With these operations in mind:

Paladin Lens Adjustments. Adjust the tilt of the Paladin to vertically position the image onto the screen then adjust the height of the Paladin so that the entire projector beam passes through unobstructed.

If the top of the image has significantly different curvature than the bottom of the image then slightly tilt the Lens to shift the image and then adjust the projector vertical lens shift to return the image to the screen. In one direction this will increase the curvature of the top and decrease the curvature of the bottom. In the other direction the reverse will happen. When the top and bottom curvatures (if any) are even then this will minimize edge distortion. NOTE: If desired, this operation can also be used to fine tune the aspect ratio (ie change the image height) although some unequal curvature may result. You may need to do these steps several times for the best adjustment. After these adjustments adjust the height of the Paladin Lens as needed to make sure the entire projector beam passes through. Finally, tighten the Bracket Screws to secure the lens configuration.

Phoenix Lens Adjustments. Adjust the tilt of the Lens so that the top and bottom edges of the image have the same amount of curvature and adjust the height of the Lens so the projector beam passes through the unobstructed. Typically this tilt adjustment results in the lens facing the approximate vertical center of the screen. Once these adjustments are made, tighten the Bracket Screws to secure the lens configuration. Finally, loosen the Thumb Knobs and rotate the lens about the vertical axis to horizontally re-center the image on the screen.



6. **CORRECTING STRANGE GEOMETRIES.** If the left / right geometries of a Paladin image do not appear the same then pivot the Lens Bracket about the vertical axis to correct (yaw adjustment). For all lens models, if one side of the image appears higher than the other then the lens must be leveled to correct (roll adjustment). This is most easily done by adding a washer/spacer between the Attachment Plate and the Lens Bracket.
7. Adjust the projector zoom and vertical lens shift to fill the screen with the 2.4:1 movie, eliminating any residual gaps by slightly overscanning onto the screen border as necessary. Perform a final focus adjustment.
8. **If using the XM2 Attachment Plate**, loosen the Thumb Knobs and move the Lens Bracket toward the projector to minimize the distance between the Lens and projector lens. **If using the XMU Attachment Plate**, slightly loosen the RPA000 thumb nuts just enough so that the Attachment Plate can be slid back to minimize the distance between the Lens and projector lens. The final distance is not important. Check to make sure the image alignment on the screen has not changed then tighten all adjustments.

ELECTRONIC CONVERGE CORRECTION

The Phoenix Lens can create color fringing which increases toward the right and left edges of the image when a projection system has a relatively small ratio of throw distance to screen width. If noticeable, this color fringing can be corrected by the Electronic Convergence Correction (ECC) feature currently available in Sony, Epson and JVC projectors, taking approximately 5 to 30 minutes to adjust depending on the projector model and level of desired correction. Note that these adjustments are performed only once during lens setup. ECC is optional for Paladin installations but any color fringing with Paladin lenses is difficult to see.

Epson: Menu -> Extended -> Panel Alignment. See the user manual for more detailed discussion regarding “Adjusting the Color Convergence”. The first step of Epson’s ECC allows you to adjust the four image corners to impact the entire image. This very quickly implements ECC but you may still wish to continue with finer adjustments per the manual.

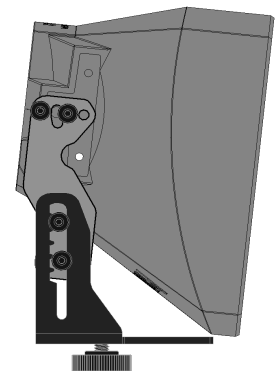
JVC: Menu -> Installation -> Pixel Adjust. Please refer to the “Zone Adjust Operation Procedure” in the user manual.

Sony: Menu -> Installation -> Panel Alignment. Please refer to the section on “Panel Alignment -> Zone” in the user manual.

OTHER TIPS

Watching smaller content. There are three options for watching 1.85:1 movies and 16:9 content. First, Anamorphic Mode II or “TV” will show smaller content in its native aspect ratio in the center of the UltraWide screen with black on left and right. Second, Anamorphic Mode I or “UltraWide” will fill the full screen with the top and bottom of smaller content cropped to fit. Finally, “Full” or “Stretch” turns off the anamorphic modes so the full 1.85:1 or 16:9 content appears stretched out to fill the screen due to the lens. You can see these three options using the Panamorph Demo Theater at the Panamorph web site (select and install your lens type, select a sample from the “TV” content, then cycle through the projector mode options). However, note that full 16:9 content is somewhat taller than UltraWide movies so a very small portion of the top and bottom will be overscanned onto the border of the UltraWide screen. If you are watching sports with scores at the top and/or bottom you may need to zoom the projector down slightly to make the scores completely visible.

Inverting the lens bracket for high shelf mounting. The bracket arms are shipped to suspend Panamorph lenses from above – typically attached to XM2 or XMU plate on top of the projector with feet up. The bracket arms can be removed from the lens and inverted so that the lens is still properly oriented with the bracket facing down to mount to a shelf. However, note that this typically restricts how much the lens can be tilted down so the bracket arms may need to be angled away from the bracket to provide this extra tilt if needed during step 5. You may



also need to mount the attachment system directly to the shelf instead of the projector with enough vertical spacing to allow the Panamorph lens to pass the entire projector beam since much of the Panamorph lens will typically be below the center of the projector lens.

Electronic distortion correction. At the lowest recommended throw ratios Panamorph lenses may require a border thickness up to 0.005 times the screen diagonal dimension to mask the distortion from the lens. Once masked this distortion is typically invisible in normal content inside the screen. However, at these low throw ratios any 16:9 or 1.85 content shown with black bars on the left and right may show curved sides. While rarely done, you may wish to consider electronic distortion correction in certain Sony and Digital Projection projector models to correct for this.

If your projector does not have anamorphic modes. Oppo UDP-203 and UDP-205 Blu-ray players have Anamorphic I and Anamorphic II modes built-in to support Phoenix and Paladin (not DCR) lenses both when playing 4K/UHD Blu-ray discs and when playing 4K/UHD external content through the HDMI input. Lumagen Radiance Pro processors also support all Panamorph lenses (include the DCR) with all anamorphic modes.

Projector compatibility. Please see the Compatibility Guide under Lens Options at www.panamorph.com for installation and usage details for specific projector models.

CLEANING

Small amounts of dust are very noticeable with a high brightness projection beam and residual wipe marks can appear as scratches under that intensity. Minor amounts of this will not impact your image as much as possible damage from excessive cleaning in pursuit of a “perfect” optical surface. Occasionally blowing off the lens surfaces with clean air is the best way to keep long term performance. If you see what appears like a scratch but that scratch changes with contact cleaning then it’s only a slight cosmetic blemish to the coating made visible by the intense light and will not impact performance. If there is any excessive residue or build-up then it is recommended that you clean the optics with professional lens cleaning supplies such as from a camera store **while the lens is in front of the lit beam of the projector**. This will allow you to quickly see your results and if the process is causing any damage.

LIMITED WARRANTY

Panamorph, Inc. warrants this product against any change in performance or functionality for a period of twenty-four months from our ship date. During this period, a unit may be repaired or replaced, at the discretion of Panamorph, Inc., by returning it in its original packaging with a copy of your receipt. This warranty does not cover damage resultant from lack of prudent care, accident or misuse (including use with other products in ways not intended); any cosmetic damage not reported within 15 days of purchase; or any performance change caused by the environment in which it is used. All damages are limited to the cost of the product.