

# Lumagen

## Radiance Pro™:

# A consumer guide to the best video processor in the world

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# Why use a Radiance Pro?

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- Better use of system budget
- Get a better picture using a less expensive projector with a Radiance Pro™ than a more expensive projector by itself, at similar or less total cost
- Improve the value of an expensive projector by improving the image quality and feature set
- Provide the best quality for projectors and TVs
- Best feature set for real-world home cinemas. Feature set honed over 20 years of helping dealers, installers and end-users, overcome specific system issues
- The Radiance Pro can adjust for setup issues created by the room, screen aspect ratio, or projector location

# Image Analysis Results

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- In a blind study by five panelists the Radiance Pro™ was the overwhelming choice for video quality of all five panelists
- Using the Tektronix PQA600C quality analysis software used by major networks and studios for quantitative quality analysis, the Radiance Pro™ scored 5.1, much better than the competition
- The Radiance Pro has won every public and private head-to-head unbiased comparison that Lumagen knows about for image quality against all comers, including stand-alone projectors
- Jon Thompson, a post-production producer at a major studio, likes the Radiance Pro image quality so much he has used the Radiance Pro for quality assurance for his consumer releases for the past six years. He said “I have seen nothing like the images that the Radiance Pro creates, and I have tested everything. It truly is the best image processor in the world, and some of the greatest directors in the world agree with me.”
- If you want to "See what the producer Intended™" you need a Radiance Pro in your home cinema.

# Optimal HDR viewing

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- Radiance Pro HDR DTM provides an exceptional image, improving on the TV/Projector's internal Tone Mapping
- Dynamically adjusts image transfer function for every frame based on DTM analysis
- You can use the Radiance Pro HDR DTM to “Tone Map” HDR to a non-HDR TV/projector, including converting the color from Rec 2020 to the Rec 709 used by SDR projectors and TVs. This works well with current 1080p TV/projector

# Auto Aspect Ratio Feature

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- The instant auto-aspect selection can detect the source aspect ratio and change selection in less than 0.1 seconds
- Auto aspect currently supports 1.33, 1.33 Pillar Box, 16:9, 1.85, 1.90, 2.00, 2.10, 2.20, 2.35, 2.40
- The Radiance Pro has aspect ratio control for anamorphic-lens, and non-lens, based systems
- Eliminates the need to use projector zoom/shift for aspect control which often is not accurate long term, and can take 15 to 20 seconds to complete
- Non-Linear-Stretch (NLS) allows 16:9, 1.85, 1.90, 2.00, 2.10, or 2.20 material to fill a 2.35 or 2.40 anamorphic screen

# Genlock

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- The Radiance Pro has a true Genlock feature
  - Every source frame output from the Radiance Pro exactly once
  - Reduces image motion-judder
  - Maintains constant input to output time to improve lipsync. Without a true genlock the audio to video delay variance can be 42 mS or more. This can cause visible lipsync issues
  - With Genlock, and Game-mode, enabled, for 16:9 in and out, and with all processing enabled, the input to output delay is fixed at approximately 3 mS

# Frame/Motion Interpolation Reality

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- Realtime Frame Interpolation (FI) is considered by many video professionals to be a demo feature. That is, it works for demos, but it fails on cinema grade content.
- FI is the first thing Lumagen tells people to turn off.
- FI is mathematically guaranteed to create artifacts. Consider an object in frame for a single frame. There can be no motion vector for that object and motion vectors are needed for every pixel or group of pixels.
- Lumagen has had customers call saying their Radiance Pro is not working right, but once Lumagen has them turn off FI, they say "Oh! That's better."

# Frame/Motion Interpolation Reality

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- Jim Peterson, Lumagen's founder, was involved with FI at another company. Technical details for good real-time FI are complex. These include dealing with motion-blur, motion-vector search-area limitations, search resolution, and identifying and processing objects. Lumagen believes these are currently beyond the capability of any single PC, and that this will be true for some time to come. Realtime issues may not be overcome in the foreseeable future.
- One major studio converting 24 Hertz movies to 60 Hertz is taking 30 seconds per frame using a large compute-farm of GPU based computers, and human intervention on every scene, or more frequently, to do a good job. And even then, the "soap opera effect" remains an issue.



# How about Frame Interpolation?

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- Tom Cruise did a video asking people to turn off their FI to have the best viewing experience for movies
  - [youtube.com/watch?v=UbCZpcy0eAk](https://www.youtube.com/watch?v=UbCZpcy0eAk)
- Here is a link to an Indiewire article on how many directors and producers hate FI. This is why they created and are recommending “Filmmaker Mode” ([filmmakermode.com](http://filmmakermode.com)):
  - Indiewire.com: Motion Smoothing: What It Is and Why Filmmakers Hate It  
[https://www.indiewire.com/features/general/what-is-motion-smoothing-how-to-turn-it-off-1234863249/?fbclid=IwAR2pv7gkVeFaBxPIUC5PNM5M\\_zfdG8Pbf2yX3v69nWqm\\_ppMvS8\\_S6BkPOA](https://www.indiewire.com/features/general/what-is-motion-smoothing-how-to-turn-it-off-1234863249/?fbclid=IwAR2pv7gkVeFaBxPIUC5PNM5M_zfdG8Pbf2yX3v69nWqm_ppMvS8_S6BkPOA)
  - Rian Johnson called FI “liquid diarrhea.”
  - Karyn Kusama said about FI: “my brain, my heart, my soul shuts down.”

# Frame/Motion Interpolation Reality

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- Here are some ground rules for proper evaluation of FI:
  - The content must be cinema grade. Do not evaluate cartoons, such as Coco that have virtually no motion blur. The evaluation you do for such cartoons is useful only for similar cartoons that lack adequate motion blur. Cartoons are used to demo because they eliminate two of the hardest issues with FI. That is dealing with objects with motion blur, and the fact that frame interpolation can create the dreaded “soap opera effect.” To properly deal with motion blur, FI must identify and recreate all the original objects that have been blurred to properly motion blur these at the new frame rate. This is impractical because of the very fact these objects have been blurred. In addition, these type of cartoons already have the “soap opera effect” and so FI does not create it in this case since it is already in the content.
  - Some cartoons, such as Cars 3, have reasonable motion blur. Big budget movies, including the special effects, generally have reasonable motion blur. These can be used for FI evaluation

# Frame/Motion Interpolation Reality

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- Here are some ground rules for proper evaluation of FI (continued):
  - If the content is produced at 24 Hertz, you must evaluate it at 24 Hertz for the non-FI case. Demos often show the 24 Hertz content at 60 Hertz, which creates motion judder. This motion judder makes the content look worse, negating the comparison results
  - View the FI on the display/projector you plan to use. TVs have different characteristics than projectors, and you may well notice different FI artifacts on a projector than you will on a TV
  - As with all video evaluation, it needs to be at viewing distance. “Pixel Peeping” shows things you cannot see at viewing distance and hides things you can see at viewing distance. Lumagen strongly recommends ignoring screen shots and doing all your video evaluation with the intended TV, projector, or LED video wall, at viewing distance, and viewing cinema grade content. Harder to do, but you get valid results

# Radiance Pro Design

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- Custom “ground-up” design for best performance
- Custom “ground-up” design for best cost-performance
- Custom “ground-up” design for best performance per Watt of power
- Quiet, low-power design. The 4242-18G was recently measured at <32 Watts, including external power brick with 18 GHz input and output.
- FPGA design allows complete field upgradable redesign
- Not just an off-the-shelf PC with huge markup, and the typical PC product reliability and longevity issues.
- Supplied in a 1U rack-mountable case. Optional compact case available for 4240 and 4242

# Audio Clock Dejitter in 5XXX

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- The Radiance Pro does not process audio. However, the Radiance Pro 5XXX models can reduce the HDMI audio data and clock jitter and has lower electrical noise. This can improve audio quality by sending the audio processor a lower-jitter signal, which in turn can reduce jitter at the DACs.
  - Feedback has been that Lumagen is under selling the 5XXX audio improvement
  - Feedback has been that the “soundstage is more open,” that “there is less distortion” and “the sound is cleaner even when playing very loud.”
  - Measured data-jitter is about 45 pS, and measured clock jitter is about 10 pS. This is exceptionally low

# Lumagen Support

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- The standard Limited Warranty is 2-years for all sales starting April 1, 2023
- The optional extension of the Limited-Warranty to five-years from initial ship date is \$500 USA retail for any Radiance Pro model
- Lumagen has what we believe is a well-earned reputation for the best support in the industry
- Lumagen support is available to all dealers, and end users by email or phone often including evenings and weekends. Note: Lumagen is on USA Pacific Time
- Lumagen will assist with every install if called upon to do so. Please email or call and we will assist you

# Testimonials

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Just a note in regards to my opinion on the Lumagen / Envy... I am a LONG term madVR user, so my "Bias" has always been for madVR even though i owned the Lumagen. When i did my original comparison i invited 5 guests that had no preferences to either madVR or Lumagen. I did this to take any "Bias" i may have for either product out of the equation. What shocked me...and i really mean that ! is ALL 5 guests chose the Lumagen in the blind tests we did ! I really did not anticipate that result. This was purely based on IMAGE QUALITY .. So not just my opinion on this. :) I have since done many comparisons using madVR on my HTPC and the 5348 ...and not once has the preference gone the way of madVR!

Woofers on AVS Forum

It [the May 2022 pipeline enhancement release] tells me that previously i wouldn't go back to using any other form of Video Processor, and now it tells me there would be "No Chance in Hell" i would ever go back to using another Video processor.

Woofers on AVS Forum

# Testimonials

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There is no right or wrong for this as you are taking an image mastered at one level, trying to make it look good at a much lower level. When HDR10 was created, the people who came up with it thought it could be done simply by mathematics. How wrong they were, as you can't do it simply as it is all perceptual, and the human eye is not linear in any way. It's logarithmic but still does not mathematically correlate. Jim and Pat have worked very hard to make this work. It looks so good because of the human fine-tuning they have been doing over the last year. ... In a single pass, [Colourfront editing software is] not close to getting as good a result as you do with the Radiance Pro. Many of the Bluray versions these days are done by doing a remap in Colourfront and if you do a side-by-side of the 4K via a Lumagen and the Bluray. The Bluray looks horrible. ... There are no right answers, as each display/projector setup will give you different results. I've had a very high-end director very concerned and amused that nothing looks anything like the HDR version he signed off on in the grade on a reference monitor. He agreed the best for his vision was the one through his Lumagen, and he owns nearly as many Lumagens as he has Oscars. (he has lots of Oscars). ... My hat is off to the great work Jim and Pat have done. It's been a team effort with guys like JAVS, helping them fine-tune it. Many of you guys have chipped in, and it's paid off. I have seen nothing like the images that the Radiance Pro creates, and I have tested everything. It truly is the best image processor in the world, and some of the greatest directors in the world agree with me. Enjoy, as it's all about enjoyment.

Jonnyfocal on AVS Forum (Jon Thompson, a movie producer doing post-production for a major movie studio)



# Testimonials

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... a very well known member in the UK jockychan. Came over to mine and compared my madVR Envy extreme with the pro. I have to admit once the pro DTM and other things where setup correctly by jockychan after we compared both units. The lumagen wiped the floor against my MadVR Envy Extreme especially with the DTM and scaling. I'm selling my Envy extreme.

Chicagobear1 on AVS Forum

“The improvements I have seen in this product since I bought it are incredible.”

Audioguy, AVS Forum

“As for the Radiance Pro, all I regret is not buying it earlier. It has made every picture better. Old and new, it's night and day, worth every penny.”

gadgetfreaky, AVS Forum

I can't imagine ever again using a projector without a Lumagen.

Jeffy B by email

... once it's setup there's no need to go into the menu. The image out of the lumagen still brings a smile on my face.

Aaron T. on AVS Forum

# Testimonials

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“In the 8 months I've been using my Lumagen [Radiance] Pro it has truly been an amazing performer - wow! With a few little steps, the image quality is nothing short of breathtaking.”  
Dan M.

“The feature-set, level of picture control, and overall performance put this video processor in a class of its own.”  
Dylan Seeger, [hometheaterreview.com](http://hometheaterreview.com)

I just rewatched the Daniel Craig Bonds leading up to the latest one in insanely good looking 4k UHD HDR -- the detail, the color (not too saturated!), the depth -- this would be impossible on my projector weren't for my LRP.  
DigitalAV on AVS Forum

“Just upgraded my Radiance Pro 4446+ to the new 5348. There is magic in this new box!”  
Kristen on AVS Forum

“Fantastic product for getting the best out of your system and for simplifying use of the system.”  
Mike G., AVS Forum

“I can't imagine having a serious projector-based setup without a Radiance Pro.”  
Karl Maga, AVS Forum

# Testimonials

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I've had a few days now with a new 4242 and I just want to say that this unit is amazing, with very minimal initial configuration. I wish I'd had one a long time ago.  
c.kingsley on AVS Forum

“I finally got around to updating my Pro with the latest firmware and tried dynamic tone mapping. I am not sure what kind of voodoo you guys have out there in Oregon, but wow..... :-).”  
John B.

The Lumagen has so far proven to be an absolutely essential component in my system. Anyone with a projector should be running with a Lumagen. I can go so far as to say it has made as much of a difference for the output as upgrading my Sony projector from a previous Sony 675ES (1800 lumen) to the 5000ES (5000 lumen). Now the color pops and the dark scenes are very black. This visual enhancement in combination with the aspect ratio control makes it absolutely worth the price of admission!  
Keith M by email

“Lumagen makes me feel, after every major update, that I get a new projector every time, from IM to the DTM a day and night change. It's a game changer and it's a must.”  
Ahmed, Bahrain

# Testimonials

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“Lumagen's claim of producing studio-grade reference images is no stretch of the imagination. Indeed, it produced some of the finest images I've seen in my time as a calibrator, not to mention the best looking HDR images I've witnessed from any projector regardless of price point.”

Tony O'Brien, [stereo.net.au](http://stereo.net.au)

The LRP has proven to be the best purchase I made for my HT and I think it is essential. Had I known just how much impact it would make, I would have listened to Kris when he calibrated my projector and offered to demonstrate one for me. I was stupid. But I sure do get it now.

Dr. Niles Crane on AVS Forum

Man I am so happy with my Lumagen its an unbelievable product from a great team who really care. thank you so much. It really is a set and forget product once its setup how you like it and is soooo good. It really is hard to beat what you get out of the product. keep up the great work. I marvel over the picture every time I look at the picture.

Sandyj on AVS Forum

# Testimonials

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I continue to be just blown away by this product. It just keeps getting better, better and more better - all for ZERO charge.  
Audioguy on AVS Forum

Watched the night scenes from the 4K Avatar and 1917, with this latest Lumagen firmware and my RS4100 (calibrated by KD), makes me wonder how it could look better. Amazing picture!  
SJHT on AVS Forum

The Lumagen has proven to be the backbone problem solver of my entire home theater. Having a scope screen, if someone were to remove my Lumagen from my rack I would feel it missing immediately! The fact that Jim & Pat continue to make it better is bonkers. Other companies would have already released new hardware telling you it's impossible to make it any better with the existing hardware and make you buy new hardware (cough Madvr cough).  
Jrod79 on AVS Forum

I am so amazed with the images that this new software is providing absolutely fantastic. Shadow detail, Color , highlights all so good. Watching all my favorites again It feels like I just got a new piece of equipment. Thank you !!! Jim and Patrick for your support.  
DVD Man on AVS Forum

# Testimonials

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... the Lumagen team's openness, expertise, and willingness to embrace expert feedback and opinion, and actually do something constructive with it, is beyond impressive. Lumagen is hands-down the best electronic device (the performance, engagement, attitude, and support) I've ever owned. Loved this purchase.

Edthomp on AVS Forum

I use the Lumagen 4242 that I had Kris calibrate for my JVC NZ8. As a test and out our curiosity, I watched HDR using the Lumagen, then removed the Lumagen and used the JVC tone mapping. It took about 10 minutes to put the Lumagen back in, and I never considered using the JVC tone mapping again. The differences were instantly noticeable, better dynamics and color. The picture quality with the Lumagen in the video path is an upgrade over the projector alone. I am one of those people who has a simple setup: 16:9 screen, exclusively use the Kaleidescape to watch movies, no-lens, no stretching, no aspect change worries. I just want picture quality and to watch the movie as delivered. Have 'zero' special cases or considerations, and the Lumagen's increase in picture quality is worth every penny for that case alone, even in the simplest most fundamental base case setup it adds value.

Edthomp on AVS Forum

# About Lumagen

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- Lumagen has been designing, and manufacturing, award winning video processors in the USA for over 20 years
- Lumagen has had the staying power to outperform and outlast many rivals. We do not expect this to change
- At Lumagen we work hard to provide the best pre-sale and after-sale support in the industry
- At Lumagen we work to “under-promise and over-deliver.” We strive for understated excellence

# Radiance Pro Summary

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- “See what the producer intended™”
- Lumagen is dedicated to providing studio-reference-quality images for home cinema.
- The best feature set, best scaling, and best HDR DTM
- Setup features provide a solution for just about any special home cinema requirement
- Anamorphic screen instant auto-aspect ratio control
- A “living product” with free performance and feature updates
- FPGA architecture allows a complete reworking of the video processing pipeline as was done in 2022
- Don’t just believe us that the Radiance Pro is superior. Do your own comparison. We believe you will come to the same conclusion as others who have taken the time to properly evaluate video processing. That is, the Radiance Pro is by far the best video processor, provides the best picture quality at viewing distance, the best feature set, and due to its ground-up custom design, all at a dramatically lower price than the competition