

# THE PLF ICEBERG



How  
a PLF  
experience  
operates;  
the  
technology  
below the  
surface

▶ **Cody Polla, Harkness Screens**



**Y**ou probably know everything about Premium Large Format (PLF) by now; how comfortable the seats are, the stunning image and sound quality, experiences enhanced with premium services like private gateways, bars, restaurants and in-seat eateries. But do you know about the technology that not only sits behind it but keeps it working at the level movie-goers expect?

Let's discover the technical challenges that PLF systems are facing daily and how these systems are maintained at the highest levels. When operating at their best, PLF systems offer movie-goers an amazing immersive experience, combining size and scale with incredible stories.

## Growth Driven By Quality

Over the past two decades there has been enormous growth in the PLF sector through the likes of IMAX, Dolby Cinema, ScreenX, 4DX and a host of exhibitor own-brand premium experiences, providing evidence that movie-goers recognize the value of PLFs. In fact in 2019, Harkness Screens commissioned research in the USA (through National CineMedia's Ask The Audience panel) which highlighted that over 60% of movie-goers associate premium cinema with premium brands. And when questioned about which elements of the experience signify "premium", 75% suggested

picture quality was the most important factor, closely followed by comfort, audio quality and then screen size.

That association between picture quality and premium experience is indeed valid. PLF theaters in today's cinemas are technological marvels, providing stunning image quality, and projecting upwards of 108 Nits (31fL) in 2D projection on 15m+ screens around the world. These projectors from the likes of Christie, Barco and NEC enable experiences at scale to be delivered through the latest laser technologies, particularly RGB. But often where screens are a significant size it is not possible with a single projection system to maintain these light levels over the life of the cinema auditorium (without a correctly specified gain screen).

## Dual Projection Challenges

Often large-sized premium format systems need to deploy dual projection technology providing more than 60,000 lumens to hit these exceptional levels of brightness and maintain them throughout the life of the projector. This is especially applicable to RGB laser projectors where creating sufficient headroom in power levels is essential.

Whilst dual projectors are often a requirement for large-scale PLFs, such projection setups do require significantly more management and interaction from busy technical managers than a single projection setup. The main pain points caused by dual projection setups include dual

^ (Clockwise from top left): Taking a screen reading; two NEC digital projectors running onscreen tests; measuring luminance levels; an onscreen test pattern for system configuration and confirmation



## The Benefits of Automation

Whilst there are several handheld systems, meters, and manual tools to check the consistency of these metrics, they require an on-site technician or regular visits from engineers to identify and correct presentation issues. And there is always potential for differing results from visit to visit depending on various factors including the consistency of the engineer (is it the same person each time?) or the calibration of their equipment. Having a pre-installed automated monitoring tool allows system management tasks to be carried out automatically and on a consistent schedule in a consistent way, ensuring that it is comparable each time. This means that presentation quality is maintained, genuine faults or issues are identified faster, and often the requirement for onsite visits is dramatically reduced. By deploying an automated tool, exhibitors are able to maintain on-screen excellence and also quickly realise a return on investment through the deployment of such “always on” technology - and with substantially fewer disappointed customers.

Without network operation centre (NOC) integration, the tools are only as reliable as the person running the data up the chain. Whether this is a visual check or a manual reading from a spectrometer, the data needs to be relayed manually, and there’s always a risk that the data can be corrupted or mismanaged. When using a modern calibration system, it is important to know how your monitoring services are alerted when there is a problem. SNMP traps with NOC monitoring, after running daily checks, can ensure the right personnel are alerted as soon as something is determined to be out of specification. Other cinema monitoring solutions include custom integrations with monitoring and TMS systems such >

alignment, light balancing between projectors, colour drift, flat/scope lens alignment, projector focus, and keystone. So, to ensure that these problems are eliminated and the specifications of these high-end theaters are met at all times, exhibitors around the world are increasingly turning to automation to drive efficiency and help them manage these presentation and calibration challenges.

## Not Just Dual Projection

Several automation products exist to manage presentation excellence and whilst dual projection systems are a primary driver for the demand of these, exhibitors with single projection setups, where quality matters, often also deploy automation systems for precisely the same reason.

Calibration systems that help keep these projection systems operational and aligned include Qalif Ultimate and Dual, Christie Duo and Mystique, and other proprietary systems from the likes of IMAX and CGS. The quality and features of these systems vary with the technology and algorithms developed by the respective companies. With these systems, integration with the projector, playback server, automation systems, and NOC are key features that must be considered beyond the quality of the result of calibration. Leading devices such as the Qalif Ultimate can guarantee dual calibration alignment down to 1.0 pixel on the zoom and 0.1 pixel on both the X and Y alignment with projector-on-projector alignment or using saved references for repeated on-screen consistency. It must also be considered to do this for both flat and scope projection aspect ratios, as scaling and cropping in a premium experience is highly frowned upon. Additional systems to improve alignments include Christie’s Mystique and custom IMAX systems. These products can map on-screen projections and move pixels at the chip level to provide a single image with limited blur due to pixel misalignment.

Other metrics that may be noticed in the theatre by patrons, and that need to be routinely monitored, include projector focus, light uniformity on a single projector and between projectors, colour shift on projector output and even audio channel output for Dolby Atmos systems.

## ● FEATURE



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Two NEC digital  
projectors

as CES Cielo+, GDC TMS, Unique X, CineXpert etc.

There are many theatres with PLFs and proprietary premium formats that use these, or custom-designed, calibration systems to ensure premium quality. As a leader in the PLF space, Dolby Cinema uses state-of-the-art technology throughout their cinemas and they manage that ecosystem with Qalif Ultimate. PLF pioneers, IMAX, developed and integrated a custom-designed alignment and audio calibration system into their auditoria.

### Is Automation Only for PLF?

Absolutely not! Automation systems have the potential to become the norm for exhibitors around the world. When you

consider the financial cost, time involved and the environmental impact of sending an engineer to cinema sites to carry out regular health checks, deploying an automation tool makes perfect sense.

When you consider the complexity of projection systems and how they're evolving, seemingly every day, it's likely most, if not all, auditoria will need monitoring systems in the future. Products like Qalif Optimizer or USL LSS-100 are already installed in many cinemas around the world, performing calibrations daily or weekly to ensure these cinemas are kept to the highest standards to ensure patrons return for more cinema adventures. And, after all, that's what it's all about - maintaining the magic of cinema. **CT**

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