

Application Note

Let There Be Light!

Affordable Colored-LED House Lights for Your Church Using ZOBO

Abstract

“And the earth was without form, and void; and darkness was upon the face of the deep.”

A void of darkness: this is certainly not how most of us want our churches to look and feel, and in the same way that God had the good sense to create light, we too may find ourselves looking to improve lighting that isn't performing in our places of worship .

Many churches find themselves needing to renovate old lighting. Broken dimmers, unavailable incandescent or halogen replacements , and growing expectations for the worship experience may lead a church to weigh the option of replacing existing lighting, but this can often come with sticker shock.

This App Note looks at how churches with recessed “can” type house lights can overhaul their lighting with a wirelessly dimmable, color-changeable LED lighting system which significantly reduces both product and installation costs for such a major lighting renovation. The case study will review a project which fully replaced the house lighting for a 1300-seat sanctuary at the Word of Life church in Honolulu, and will utilize this project as a reference for where this kind of lighting system is applicable. The goal is to show the kinds of problems that churches like Word of Life run into with house lighting renovations, the alternatives for solutions in this application, and how Luxium's ZOBO system can serve as the most cost-effective, highest-quality solution for many of these types of churches.

Right: *Word of Life's worship sanctuary. Luxium Lighting's ZOBO system enabled a state-of-the-art lighting LED lighting experience at a significantly reduced cost.*



LEDs as House Lights?

Churches have a lot to be concerned about with regards to lighting. As lighting that is used in applications from general lighting to setting a mood, it's especially important to choose the right house lighting solution due to the versatility that it needs to offer—the house lighting should never steal the show, but it should always *add* to the experience and should certainly never distract from it. A great house lighting solution has the flexibility to create a mood and an energy for the room. It also needs to work in unison with the other lights in the room—dimming to black when the stage needs to be accented or flashing through colors to help get the room into a high energy state. It also has to work with video, avoiding aliasing and making skin tones look good for the camera.

All of the above concerns were taken into consideration for Word of Life's house-lighting renovation. The church has a large sanctuary with seating for 1300, so a lot of light was needed to fill the space. Existing house lighting was primarily provided by 175+ 75W halogen can light fixtures, and the new lighting had to perform at least as well as what they already had in place. The existing dimmers were largely non-functional, but a DMX console was in use for the alter and stage lighting, so having the house lighting share the same backplane made sense. All said and done, the solution needed to offer lots of high-quality light which could be easily controllable—*were LEDs the right solution?*



Converging on a Solution— **ZOBO**

When Word of Life began shopping for a solution, they found Axia Concepts, a lighting systems integrator who was familiar with specifying these types of projects. Axia knew they needed to find an affordable solution for the customer, but to do so without compromising quality. The customer had an aging dimmable incandescent house lighting system with 175-plus light fixtures, and most of the dimmer modules had failed. “We did not want the customer to invest in incandescent dimming technology” said Bryan Cole of Axia Concepts. Theatrical house light fixtures were beyond their budget and would have had high labor costs to replace the can lighting fixtures.



Why the ZOBO?

Ease of Installation and Cost Savings: Word of Life's existing house lighting was based on recessed halogen can lights, and other than the dimmers needing replacement, the existing infrastructure was in good shape. Most other LED-based house lighting solutions would have required rewiring the entire lighting system, dramatically increasing the overall project cost. However, the ZOBO-based system offered a much more cost-effective solution that took advantage of the existing can fixtures. "I love the ZOBO", says Cole, regarding them as a perfect fit for these types of house lighting upgrades, saving the end user tens of thousands in project cost. By recommending such a cost-effective solution, Cole was able to win the business and ultimately utilized over 175 of the patented ZOBO-AX1 color-tunable retrofits to create an all-new experience for the church at a very modest cost and without compromising color or quality.

Wireless DMX: As previously mentioned, WOL's dimmer interface was in poor shape, so any solution would need to either rely on replaced dimmers or find some other way to control the lighting system. As in many churches, DMX was already being used to control the stage lighting and a console was already in use, setting up the DMX-enabled ZOBO perfectly to integrate with the already existing DMX system. Axia Concepts decided to utilize ZOBO's built in ZMX interface, Luxium's wireless DMX. The biggest benefit of the wireless interface was realized in ease of installation: quite simply, they avoided having to physically string DMX cables to each fixture throughout the large facility, saving cost and installation time.

As a backup for solving potential issues with wireless range, ZOBO also features optional wired-DMX connectors, which allows the user to daisy chain wired DMX in order to patch wireless range issues.

Lighting Quality: So what about the quality of the lighting? Axia's client was initially skeptical about LED's in general, but Luxium's 6-color LED technology allowed them to get exactly what they needed. "They like a very warm white and were able to adjust to the exact white that met their needs", says Cole. "All of the lighting scenes are controlled from the lighting console, and they have experimented with various room colors."



Above: Installation of the ZOBO is as easy as removing the existing halogen lamp and screwing in the ZOBO.



Above: Luxium's wireless DMX transmitter is compatible with DMX consoles, making long-range and reliable control a reality with the ZOBO system of house lights.

Lights, Camera, Action!

ZOBO's Fit for the Ultimate Challenge—Video

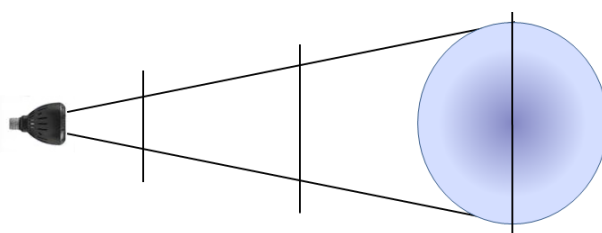
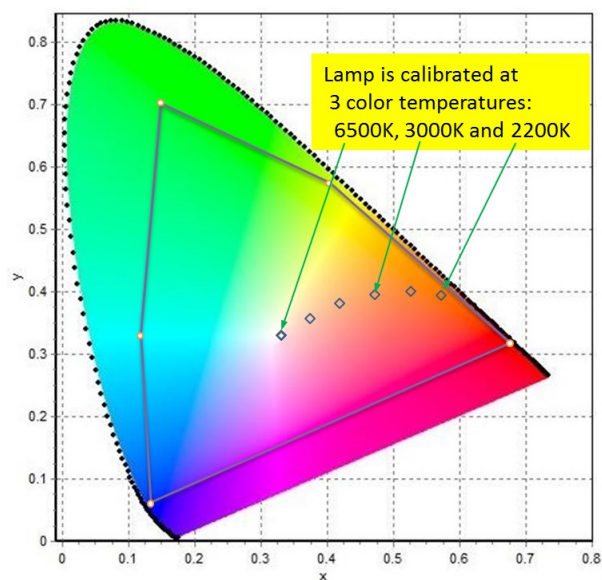
One of the most frequent challenges with LED lighting comes up when filming a scene lit with LED lights. Dimming and color-control of LEDs is usually via pulse-width modulation which can lead to aliasing in video recordings. Furthermore, low CRI ratings can render an image flat, washed out, or just the wrong color. This can be quite a disappointing result after having just invested in a new lighting system, which is why it should be a top consideration for churches looking to upgrade their house lights.

Word of Life, like many other churches, use IMAG to enhance the worship experience and stream their worship sessions online. Having great video is crucial for online engagement, and this need became a necessary consideration for their new lighting system. Luxium's ZOBOs are ideally fit for video applications and have a proven track record everywhere from Hollywood film sets to live theater recordings.

The key to ZOBOs natural fit with video applications is two-fold. The first advantage is in the pulse-width modulation scheme—it's set at 2400Hz, substantially exceeding the sampling rates for capturing digital video and overcoming any issues with aliasing that could degrade the quality of the video.

The second advantage for the ZOBO is in its ability to render color. The six-color system and Luxium's industry-leading *High CRI Palette* generates enough high quality-light to render colors flawlessly and is flexible enough to light up everything from people to paintings to altars. The calibrated whites are a leading innovation in church lighting and will ensure a consistent and high-quality look and feel.

With video being such a significant part of the worship experience—whether IMAG or streaming broadcast of the sermon—the last thing you want is to see video that distracts from the experience instead of adding to it. Many of the lights available today are not up to the task, but Luxium's ZOBO is a proven solution—look no further than Word of Life's live broadcast to see the results first hand.



Throw Distance	3' 1m	10' 3m	30' 9m
Beam Width	1.3' 0.4m	4.4' 1.3m	13' 4m
Center Brightness, lux	7500	820	80

The Results

Even with the impressive colors, video performance, and punchy beam, perhaps the ZOBO's greatest trick is making great lighting accessible to those who need it but don't have a bottomless budget. "It's really a cost savings to the customer", says Cole about the ZOBO. "There would have been a labor cost to have an electrician install the purpose-built warm white or color ceiling can or pendant fixtures. This could have easily been a week of labor for a team of five, on top of the already higher cost of the fixture \$800 - \$1600 each... We were able to do this project using ZOBOs for 1/3 of the cost

of typical theatrical house lights."

Just like a hammer makes everything look like a nail, having the same lighting solution for every client doesn't account for the different needs that makes each church unique. For many churches, a tear-out of existing lights just doesn't make sense. A solution like the one that Axia Concepts and Luxium Lighting designed for their client can lead to a quicker, more cost-effective path to an efficient and visually powerful colored lighting system.



Authors and Credits

This Application Note was written as a joint effort between Luxium Lighting and Axia Concepts. Contributions to this article were made by system integrator Bryan Cole at Axia Concepts and lighting consultant David Roberts at DX2 Broadcast.

Need More Info?

For more information on how Luxium's solutions can solve your Church Lighting needs, please contact us at info@luxiumlighting.com for general inquiries or reach out to the author, Oke Tammik, Marketing VP at Luxium, at oket@luxiumlighting.com

