

The Six Top Electrical Traps for New AVL Installations

With advanced AVL gear, smart LED lighting and video walls being installed in many houses of worship — large, small, or mega churches — many users forget a simple truth; the shiny new technology requires electrical power, and advanced electrical system planning can help you get the most out of your technology investment.

When budgeting, specifying, and integrating new AVL assets, electrical systems are often overlooked or ignored completely; and that can lead to a great deal of pain and cost down the line. We spoke with Alan Tschirner, VP and GM of LynTec, about the six biggest questions they hear from their customers, and what can be done to address them.

“We just installed new LED fixtures and make sure to turn everything off at the end of every service; so why are our energy costs so high?”

It's a common misconception that once your new energy

efficient smart LED fixtures are turned off after a service that they are actually off. While in standby mode, power is still running to all of your AV gear and smart LED fixtures unless you have on/off control at the branch level. Vampire or phantom power consumption has a number of detrimental effects on AVL assets, like reducing their overall lifetime and generating unwanted heat. Heat is the enemy of electrical devices — running AVL assets without proper HVAC shortens device life and raises costs. Any additional heat load requires increased cooling, which in turn, burns through your budget. The good news is you can improve reliability by only powering systems when needed, which is roughly three to five percent of the time. Smart LED fixtures, video walls and AVL gear will last longer and require less maintenance if they're turned off at the circuit breaker when not being used.

“We've added lots of new equipment; can our old electrical system handle it?”

New LED moving lights and video walls were science fiction when many churches were originally designed, and those older structures do not have adequate electrical systems to support current AVL technology or large equipment upgrades as new systems require higher power densities. But as long as your electrical systems are up to recent National Electrical Code, your system should be fine.

Getting the utility to upgrade your service and having your electrician install a new circuit breaker panel is a relatively easy task. An important consideration with your new electronics is that harmonic currents from high efficiency switch mode power supplies found in computers and other electronic equipment may cause overheating in 3 phase neutral conductors in your electrical systems. This can be dealt with by upgrading or oversizing your neutral wiring and panel lugs.

“We've already got a breaker panel, so we don't need to buy a new one for the upgrade.”

Often new installs will underestimate project costs resulting in cutting “boring” electrical infrastructure; no one thinks about the grey breaker box in the supply closet until it's too late. System designers will call for upgraded electrical systems, the church will be surprised by the entire project cost and look to reduce costs, at that point the upgraded electrical will lose out to all the new moving lights and upgraded line array in the sanctuary.

We all know that electrical systems are not as exciting as moving lights or video walls, and a new electrical system seems like an easy budget cut compared to fewer lights or smaller video wall. However, none of those fancy machines can work without a reliable source to distribute and control the flow of power. If there is no one in the discussion fighting to keep electrical upgrades, as part of the budget, then the project will suffer over the long haul.

“Our standby energy costs aren't that high, why else would I want to turn all of our gear off?”

Most houses of worship only use their AV assets for a few

hours per week, either during rehearsals or for services, with no real idea of what that means to assets that pull power even when on standby. This is exactly like leaving your car running in the driveway because you are planning to drive it tomorrow. Left on over time, equipment is exposed to surges, sags, and glitches when not in use. Removing power from the lighting devices and video walls isolates them from power anomalies, protecting the assets and the electrical system as well.

Installing a motorized circuit breaker panel in place of a standard circuit breaker panel, or adding a relay panel after a standard circuit breaker panel, give you an affordable way to turn all of your gear off at the power panel with the touch of a single button. This can be an affordable process that any of your volunteer staff can manage, and it will help your equipment last longer and lower your maintenance costs.

“Electrical control systems are pretty complex, can our volunteer AVL staff manage it?”

Many houses of worship rely heavily on the operation of AV systems by volunteer technical staff. Unfortunately, the complex, delicate equipment that your church just paid a great deal of money to install is very susceptible to damage even by the most well-meaning of volunteers. When installing a new system, training is a must, especially when one considers the high volunteer turnover experienced at a great deal of churches. By maintaining consistent training and assigning responsibility for specific AV functions, electrical systems and those oh-so-delicate AV assets will remain in good working order for a long time.

The nice part about automated electrical systems is just that, they're automatic! It's a simple process to add occupancy sensors that turn systems or lighting off if no ones in the room, it's also a snap to add a scheduled clock timer to make sure that everything is off after hours. A simple sensor running a contact closure prompt to a controllable circuit breaker panel or relay panel will make sure that your equipment is off and protected.

“When we need to turn everything off for the night, we just flip the circuit breaker handle, right?”

Circuit breakers and switches are two very, very different things. The National Electrical Code specifically states that circuit breaker handles are not to be used as switches. Only circuit breakers rated as SWD by (Underwriters Laboratories) UL or electrical relays may be used as switches. These circuit breakers are evaluated for high endurance use, since they will be used in a similar fashion to a light switch.

As few as 20 cycles of the handle of a non-SWD rated breakers can diminish current handling of a breaker possibly leading to nuisance trips, which leads to having a specialist come in, which in turn raises overall costs, and can damage sensitive equipment. Unless you have an assigned technician maintaining the system, you really have no method to confirm intended status; were the correct breakers turned on or off? The best way to resolve this issue is through a power control system that offers remote monitoring and zone control of electrical systems by a professional. ◆