



SOLUTION OVERVIEW

Traditional large scale industrial lighting projects (>20 kW) use a single AC-DC driver per each Luminaire (typically 200 to 600 W). Using a single driver per Luminaire increases wiring complexity and 3-phase facility power balancing issues. The added weight of each driver also requires ceiling reinforcement and adds heat within the customer's building. Reliability of the lighting system is dependent on driver performance which often fail faster than the Luminaire causing more frequent repairs.

The AE solution addresses these shortcomings by relocating all the individual drivers to a separate control room and providing high voltage (250+ Volts) of accurately-controlled DC current directly to the Luminaire. This direct connection to 3-phase utility eliminates the phase balancing issue and sophisticated dimming and timing control is simple and centralized.



Target Markets/Customers

The AE solution is perfect for any LED lighting project that is >20 kW in power requirements. Below this level it does not make economical sense.

Typical Applications:

- Large Warehouse
- Factory
- Gymnasium
- Large stores and supermarkets
- Parking Lots/Structures
- Sporting Venues
- Large Architectural Lighting projects

Most common types of customers are Lighting integration and Construction Engineering Companies.

In some cases, LED Luminaire manufactures will want to partner with the AE solution for a complete lighting package.

Where to Avoid

Where environmental conditions would call for a high Ingress Protection (IP) rating.

Audience – who to engage and when

Two types of audiences are recommended and can be engaged either at the same time or in different settings/meetings:

1. System or layout engineers calculating lighting requirements

layout and power requirements will require use of technical presentations. Pitch should be given by FAE level.

2. Higher level business owners looking for ROI and OP-X/CAP-X presentations showing actual realized savings and superior serviceability. Pitch can be given by both FAE and/or Sales Engineering.

Note: AE Product Marketing can provide a complete set of actual installations and ROI calculations based on Horticulture Lighting, which is extremely similar.

Business Benefits

- Eliminate drivers from the grow room
- Reduce energy and installation costs

- Simplify lighting control for any LED fixtures
- Eliminate costly Technician Service calls
- Motion/Proximity sensing and timed power reduction during non-peak hours

In 2024 AE will also be able to provide turnkey solutions at a power system level to further decrease the cost of ownership for the end user through the integrator/construction engineer.

INDUSTRIAL LIGHTING

Qualifying Questions

- Do you have a site lighting map, or do you need help generating one?
- What is your utility power being used for lighting (Voltage/Phase/Current)?
- Have you defined what Luminaires are being used (unless talking to a Luminaire manufacturer)?
- What type of control is required?
- Do you have a remote power closet or area for the Lighting power system to reside?
- What are the requirements for noise from the power supply and for protections (overcurrent etc.)?
- What is the current purchase volume and how will that change over time?
- What are expectations for delivery lead times?
- Do you have future projects that affect your power supply needs, and should be considered in the solution?

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Customer Challenges

The end customer needs a reliable solution that is simple to use and has low maintenance costs. Lighting control and regional requirements for back-up lighting can also be needed.

1. Power Line balancing with high voltage utility 3-phase power.
2. Complex wiring for on/off and dimming control.

3. High cost of circuit breakers to run AC to each light.
4. More HVAC required to cool extra heat generated by LED drivers.
5. Complex and high-cost electrician required for repair
6. Need for separate emergency lighting



Key Features & Specs (high-level differentiators)

1. The AE Lighting Solution is hot pluggable, so the end user can swap out 4 kW blocks for power without shutting down the system or calling electricians.
2. 3 phase input eliminates the need for phase balancing.
3. All control features are part of the LLS allowing the user to set timers for dimming or on/off.

4. Interfaces with BBU systems to provide emergency back-up power, eliminating the need to separate emergency lighting.
5. Low Total Harmonic Distortion and Power Factor reduces OP-EX electric bill.
6. Simple integration of ambient light and proximity sensors for “Smart Lighting” is possible.

INDUSTRIAL LIGHTING

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COMPETITIVE ANALYSIS

Competitor	Competitor Strengths	Competitor Weakness	AE Strategy
Type A	<ul style="list-style-type: none">High Technology IP - Shock SafeSystem provides distribution cables and integrated junction boxes	<ul style="list-style-type: none">Low Power Density 3kW vs. 12kW per 1UCost (~\$1/watt)	<ul style="list-style-type: none">Cost too high, not viable for industrial lighting, only Horticulture possible
Type B	<ul style="list-style-type: none">DALI Support and software support for sensor/Switch integrationFanlessBulk Power can be divided down for use with use of NHDD 40 to 100 W HVDC	<ul style="list-style-type: none">Many independent parts needed for system including DC-DC drivers for each luminaireCannot directly drive LEDs from bulk power supply , CV to CC conversion driver needed.More difficult wiring especially when doing retrofitsCost (~\$.30/watt)	<ul style="list-style-type: none">Create new drive voltages to accomdate scaling on wider variations of applicationsAdd Turn-key solutions including emergency lighting control, communication interface and pre-installation supportPurchase or partner with LED Luminaire vendors
Type C	<ul style="list-style-type: none">Full Solution- Power, Lights, Distribution cables and controlClosed-loop lighting controls using sun light sensor	<ul style="list-style-type: none">Lights in series connection- lose one loose all lights in stringCost (~\$.70/watt)	<ul style="list-style-type: none">Cost too high, not viable for industrial lighting, only Horticulture possible



LCM4000HV Module
& LCM12K Shelf



iHP Series



Intelligent Transfer
Switch (ITS)



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Example Wiring Diagram

32 VDC LED tube string in serial configuration.

Note: Any type of tube/luminaire can be configured.

