

Why Power over Ethernet is the Future of Commercial Lighting Infrastructure

As inventions are concerned, Thomas Edison’s light bulb stands as one of the most profound breakthroughs in history. Even more incredible is that consumers and businesses still use the “Edison socket”—130 years later. Readers can download a library book or movie while flying 550 miles per hour at 40,000 feet—but many of our light sockets still contain a light source designed in the 1800’s!

With the marriage of Power over Ethernet (PoE) switches and LED lights, consumers are about to witness the biggest change in lighting since the introduction of the electric light. The purpose of this white paper is to describe the challenges with existing lighting systems and many of the benefits gained by using LEDs and PoE.

People use lighting systems to illuminate the insides of buildings, schools and factories. Some systems are used to provide accent lighting—to make lobbies and landscaping more attractive.

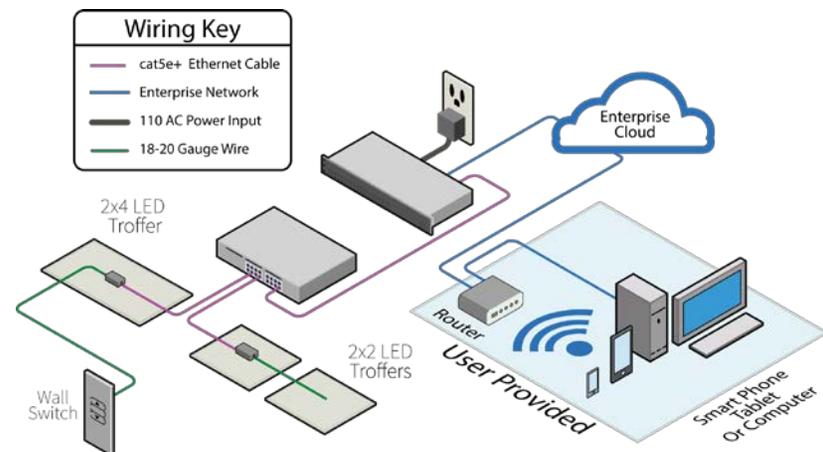
Traditional lighting systems are hardwired and offer few control options (usually on and off and sometimes “dimming”). Lighting systems must be installed and maintained by licensed electricians. Incandescent and Halogen lamps consume huge amounts of energy and convert much of it to heat—rather than light. Fluorescent lamps contain mercury, they consume large amounts of energy even when dimmed; they often produce poor light and need frequent replacement. Fluorescents emit light in 360 degrees—but most customers need it to focus downward.

With PoE+LED lighting, space reconfiguration is easy. Historically when businesses wish to reconfigure existing space, electricians are brought back to modify the lighting branch circuits and fixture position. This is costly and time consuming. In larger buildings, lighting systems are powered by a separate and dedicated 277V AC infrastructure. If controls are needed (such as for vacancy sensing or daylight harvesting) a second communication network is often added. This overlay infrastructure is usually a standalone RS485 or wireless network. Both the 277V AC infrastructure and control communication network add huge costs to the building

owner in the form of high Capex, design engineering “soft costs” and added maintenance complexity. In short, existing lighting systems are costly to install, maintain and operate. And once installed, they are inflexible.

In contrast, Power over Ethernet with LED lights enables customers to safely and easily move lights, adjust color temperature and automate failure detection—all while getting a better experience and saving energy.

Platformatics System Overview



PoE and LED benefits:

1. LEDs are energy efficient.
2. LEDs don't flicker.
3. LEDs provide a high quality of light. By providing a richer color spectrum, people gain visual perception and see richer colors and higher contrast etc. By providing a better quality of light, LEDs improve employee performance.
4. LEDs work well in cold environments.
5. LEDs operate cooler—saving air conditioning bills in the summer.
6. Many high quality LEDs come with 10 year warranties. LEDs don't require lamp and ballast changes. LED energy consumption is linear—if you dim the light to 50%, the energy consumed drops a similar amount.
7. PoE converges the electric and communication control network onto a single infrastructure.
8. PoE is safe; it doesn't require an electrician.
9. PoE switches provide clean, stable, reliable DC power—this reduces complexity and cost on light fixtures.
10. Ethernet is a global harmonized standard. Customers can use the same products anywhere on the planet. This greatly reduces inventory costs.
11. Light fixture adds, moves and changes are easy and can usually be made by anyone.
12. PoE LEDs allows administrators to set policies on each light.
13. PoE enables any/all lights to be backed up with a UPS.
14. PoE switches can often measure current at each port—enabling automated trouble reporting while providing an estimate of the fault distance.
15. PoE switches make it easy for customers to shape electric load—enabling real time demand capping—and saving money.
16. LEDs on a PoE switch behave like IT devices. They can be managed with existing IT tools.
17. Some LED fixtures enable customers to dynamically tune the color temperature.
18. LED lights can download configuration software. Many will support remote firmware updates.
19. Lights work with existing network management and energy monitoring tools.
20. LEDs can be controlled by “light play-lists”.
21. With color beacons—PoE LED networks will spawn the “applification” of light. Innovators can create new applications that use color to communicate information.
22. By moving to LEDs and PoE, it's possible to use small scale, on site renewable energy systems to power lights.
23. Customers will get better quality, value and performance for less money.
24. Lighting controls are easier to configure and modify using an Ethernet switch.
25. LEDs can transmit high speed data—lights may soon act as single user lifi access points.
26. PoE Connected Lighting will energize the IT industry. It's exciting! It's got bling! It will make IT visible!
27. PoE and LEDs will enable fixture manufacturers to reimagine how we use lights—expect a lot physical form factor innovation.
28. PoE and LEDs will ignite a new software application market.

In short, LEDs and PoE combine to provide a better experience and lower total cost of ownership when compared with large scale legacy lighting systems. The future of light is about the total experience.

For more information about our revolutionary technologies, visit www.platformatics.com