

A Smart Standard for Smart Lighting Systems

The United Nations estimates that buildings account for 36% of the world's total energy use and 39% of all energy-related carbon emissions. Considering that most buildings remain up to 70% vacant, it becomes apparent that a significant amount of the carbon being produced simply goes to waste.

“The margin between carbon produced and carbon actually used is the ‘Holy Grail’ of energy efficiency,” says Chris Winwood, Business Development Manager – Commercial Products at Amphenol Information Communications and Commercial Products. “Smart lighting can help us close this gap while opening the door to major gains in energy savings.”



Smart lighting describes a lighting structure that is interconnected through a network and is operated and maintained by a centralized building system or through the cloud. It can incorporate different technologies, including occupancy sensors, air quality monitoring, light level sensing, and asset management.

Traditionally, smart lighting controls have been used to control the level of lighting in an energy-efficient manner, such as maintaining the desired level of light in specific areas. But this is only the tip of the iceberg.

Smart lighting systems have the potential to use lighting controls to connect a range of other services, including data collection and analysis, security, fire safety, climate control, navigation – even programs for booking conference rooms.

“Digital networking technology is rapidly developing, but the smart building infrastructure needed to take advantage of this technology doesn’t exist today to fully capitalize on these developments,” explains Adrian Green, Engineering Director at Amphenol Commercial Products. “What’s needed are smart LED luminaires that can be easily upgraded to allow for future IoT connectivity. Standardization can enable that.”

This is where Zhaga Book 20 comes into play.

An Essential Step Towards Smart Building Infrastructure

Zhaga Book 20 brings together complementary specifications from the Zhaga Consortium and the Digital Illumination Interface Alliance’s (DiiA). The result is an essential standard towards achieving smart



building infrastructure, which specifies smart, interoperable LED luminaires with easily upgradeable IoT connectivity.

The Zhaga Consortium is a global lighting-industry organization that aims to standardize interfaces of components of LED luminaires, including LED light engines, LED modules, LED arrays, holders, electronic control gear (LED drivers), connectors, and sensing/communication modules. DiiA is the global industry organization for the Digital Addressable Lighting Interface (DALI), the global standard for digital communication between lighting-control devices.

Specifically, Book 20 defines an interface between an indoor LED luminaire and a sensing/communication module. Through the interface, the module connects to the LED driver and typically provides sensory inputs or enables communication between network components. Zhaga Book 20 provides interoperability between an indoor LED luminaire and a module by specifying the interconnect as well as the mechanical interface to mount sensors directly into the luminaire. Four sizes are defined which will accommodate common configurations of sensors. Two rectangular and two cylindrical form factors are defined.

“Having a plug-and-play, connector-based interface makes it easy to add or upgrade sensors and/or communication modules,” notes Green. “This in turn enables luminaires to keep pace with the rapid developments happening in digital networking and sensing technology.”

Beyond Lighting

Other functionalities beyond lighting can also be supported. For example, the use of intelligent D4i drivers enables luminaires to collect, store, and report a wide variety of data in a standardized manner. “A smart luminaire can communicate and interact with a lighting control network, providing energy consumption data, fault detection, and many other parameters,” adds Winwood. “This can result in significant cost savings in terms of energy efficiency and maintenance.”

It can also result in significant revenue for companies. According to a report by Navigant Research, indoor LED sales are expected to grow 6.9% annually, from about \$7 billion in 2019 to an estimated \$13 billion by 2028. Furthermore, sales of lighting controls are forecasted to grow at 5.4% per year, and sales of IoT-based lighting systems by about 17.6%.

Perhaps most importantly, Zhaga Book 20 ensures that Zhaga-D4i certified luminaires will be the backbone of intelligent buildings everywhere. “By creating a simple way of adding control/sensing modules into the building system’s architecture, this standard allows building managers to select luminaires today for the technology advances of tomorrow,” says Dee Denteneer, Secretary General of the Zhaga Consortium. “This represents a step-change not only in smart lighting technology, but also in terms of energy savings.”



Certification Process

“Zhaga and DiiA have developed a joint certification program that is based on a standardized interface between drivers, luminaires, and sensing/communication modules,” continues Denteneer. “By replacing the sensor rather than the entire luminaire, we’ve essentially future proofed LED luminaires.”

The new Zhaga-D4i certifications for modules, LED luminaires, and components are available to Zhaga associate and regular members. All submitted products must be tested for compliance against Zhaga specifications. Luminaires can be certified by Dekra and Intertek, the Zhaga accredited test centers for Zhaga Book 20. If successful, the product will be awarded Zhaga-D4i certification and can use the Zhaga and D4i logos.

More information on the Zhaga-D4i certification program can be found at

https://www.zhagastandard.org/images/03_Book_20_-_Certification_updated.pdf

About Zhaga

Zhaga is a global association of lighting companies that is standardizing interfaces of components of LED luminaires, including LED light engines, LED modules, LED arrays, holders, electronic control gear (LED drivers), connectors and sensor and/or wireless communication modules. This helps to streamline the LED lighting supply chain, and to simplify LED luminaire design and manufacturing. Zhaga continues to develop specifications based on the inter-related themes of interoperable components, smart and connected lighting, and serviceable luminaires. For more information, visit www.zhagastandard.org.