



The NEW Zhaga develops connectivity interface standards for indoor luminaires

1. Introduction

Luminaires of today and tomorrow are ‘smart’. They can sense the environment around them and not just react locally in a micro ecosystem, but together with other connected luminaires they can build a much larger environment. Smart luminaires can provide energy savings, feedback on usage data and are ultimately a part of the “ambient intelligence” for example in the building or in the street. In addition, smart luminaires can be serviceable, which means the possibilities of exchanging components in case of failure or for upgrading them.

For smart outdoor luminaires, Zhaga has already created an industry specification of an outdoor connectivity plug interface, allowing serviceability and upgradeability of sensor and communication nodes. (Read more: <https://www.zhagastandard.org/books/book18/>)
Now Zhaga is embarking on the journey to simplify smart and serviceable indoor luminaire design by providing a specification for indoor connectivity interfaces.

2. Use cases

Connected indoor luminaires benefit a wide range of use cases, such as occupancy sensing, ambient light level detection, scene setting, wireless commissioning, people tracking, secure local wireless data networks, aggregated light output control or programming drivers.

Benefits are for example higher energy savings, more comfort for the user or better asset management.

In addition, a smart luminaire will also be serviceable at production stage or in the field. This will be beneficial in case of hardware and software upgrades. A luminaire can also be supplemented with an additional sensor which was not present when the luminaire was installed. The feature of serviceability will prolong the lifetime of the luminaire thereby addressing requirements from the Circular Economy legislation.

3. Today’s technology

Sensors and transceivers make a luminaire connected with its environment. These parts can be built into the luminaire for ease of electrical and mechanical installation. Luminaires are either connected via a wired protocol or a wireless transceiver.

Advantages of integrating sensors and transceivers in the luminaire are that the fixture is already powered and due to the regular positioning of the luminaires, sensors and transceivers planning can be made easier and completed at the same time as the light plan. This results in a convenient and error free process for the installer, reducing the total cost.

In certain applications, however, sensors and transceivers are not built into the luminaire. An example is the high bay installation where a PIR sensing technology built-in the luminaires will have functional problems because of thermal limitations. In other applications it might not be optimal to place a sensor in a luminaire, it might be better to place it in a ceiling instead. These types of applications will continue to exist alongside luminaire-based solutions.



Currently, no mechanical and electrical interface standards exist for the integration sensors and transceivers into a luminaire. This is hampering the development of both smart luminaires and sensor/transceiver units. With a well-defined platform, manufacturers can accelerate development times and leverage economies of scale. This would be a key contributing factor to accelerate the adoption for smart luminaires in the market place.

Today, integrated LED luminaire design and production practices often lead to luminaires being 'sealed for life', meaning they can't be serviced or upgraded. This is contrary to upcoming, European legislation, as the EU is driving the circular economy and developing policies requesting removability, reparability and serviceability in all luminaires. By providing a specification for indoor connectivity interfaces, Zhaga paves the way for luminaire manufacturers to comply with the upcoming legislation.

4. The NEW Zhaga vision

Zhaga is evolving and has widened the scope to include indoor connectivity specifications.

The vision of the Zhaga Consortium has been updated in early 2018 and now contains the following:

- On top of their primary lighting task, LED luminaires are becoming increasingly smart and connected to IoT networks
- The design of a new luminaire is facilitated by the availability of a large supply of interoperable components, based on standardized interfaces, while still encouraging differentiation.
- Zhaga creates specifications for electrical, mechanical, optical, thermal and communication interfaces for interoperable components to be used in LED luminaires.
- These interoperable components allow the upgrading and servicing of LED luminaires, depending on the design choices by the luminaire manufacturer.
- The ability to upgrade LED luminaires after installation is of great benefit to end customers

5. Planned Zhaga specification on indoor connectivity

In Zhaga the specification for the mechanical and electrical and control interfaces of the indoor luminaires and the sensors/transceivers will be fully defined. Key elements will include the overall mechanical fit and the number, type and use of the electrical connections.

Depending on the use cases different mechanical, electrical and control interfaces are expected to be developed.

Zhaga members like Osram, Philips, Tridonic, Samsung, Legrand, BAG and Helvar, TCI, Panasonic and TE Connectivity, all have a portfolio of sensors and or transceivers which are designed to be built into luminaires. Experts from these companies will participate in the specification process.

The Zhaga consortium also welcomes new members interested in supporting the development of an indoor connectivity specification. This specification development is due to start in Q2 of 2018.