

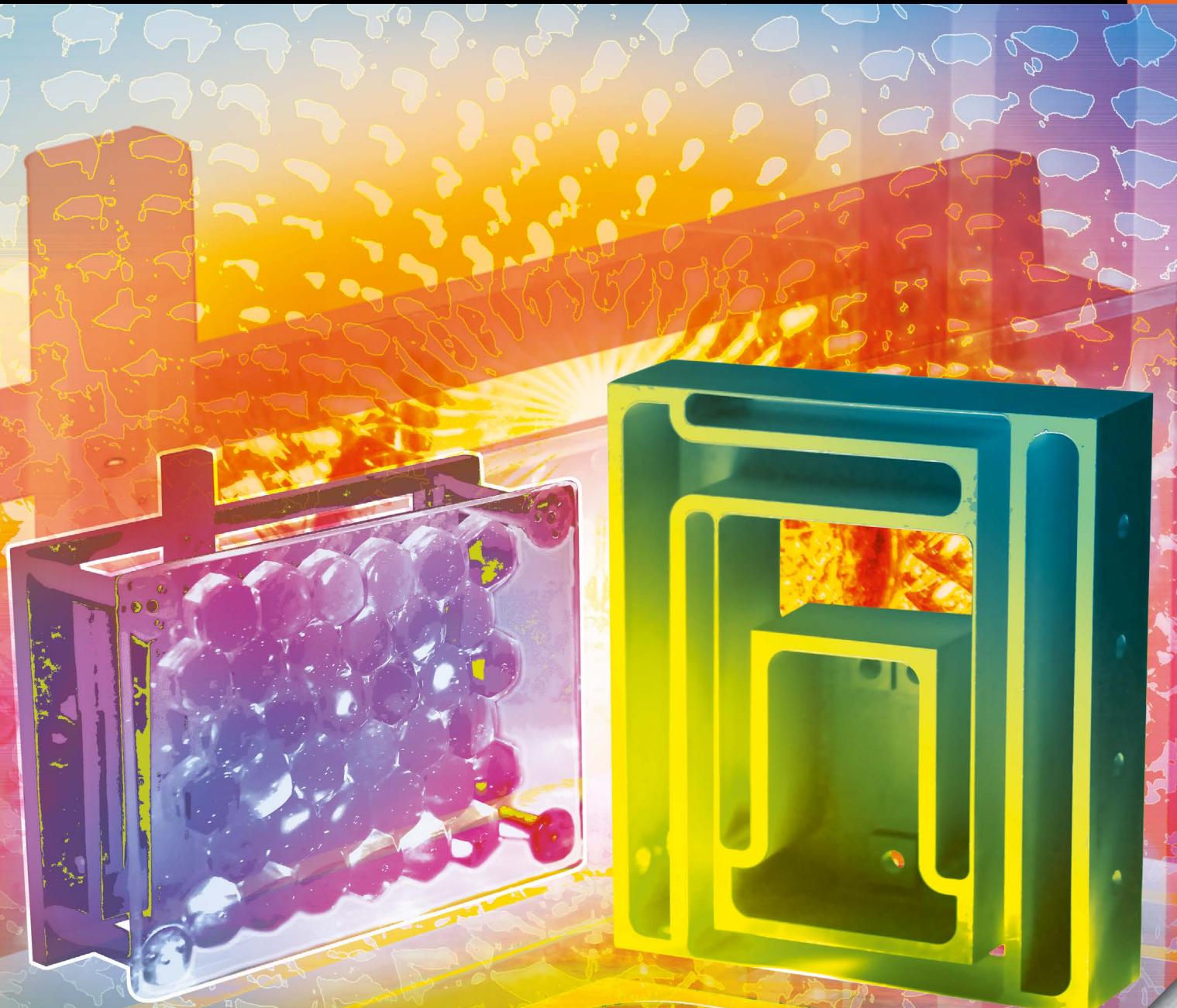
## Review

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DiiA & Zhaga: Zhaga-D4i Certification Program

Special  
Excerpt

# Zhaga-D4i Certification Signals Plug-and-Play Interoperability

The new Zhaga-D4i certification program and logo indicates plug-and-play interoperability of luminaires, sensors and communication nodes, and represents an important collaboration between two major, innovative lighting-industry organizations, Zhaga and DiiA.

As open, global lighting industry associations involved in standardization, the Zhaga Consortium and the Digital Illumination Interface Alliance (DiiA) bring together several hundred member companies from across the lighting industry. The new Zhaga-D4i certification program is the result of an ongoing cooperation and consensus between the two organizations, and combines expertise in different areas to achieve a goal that brings substantial benefits to the lighting market.

In technical terms, Zhaga and DiiA have standardized the interface between outdoor LED luminaires and

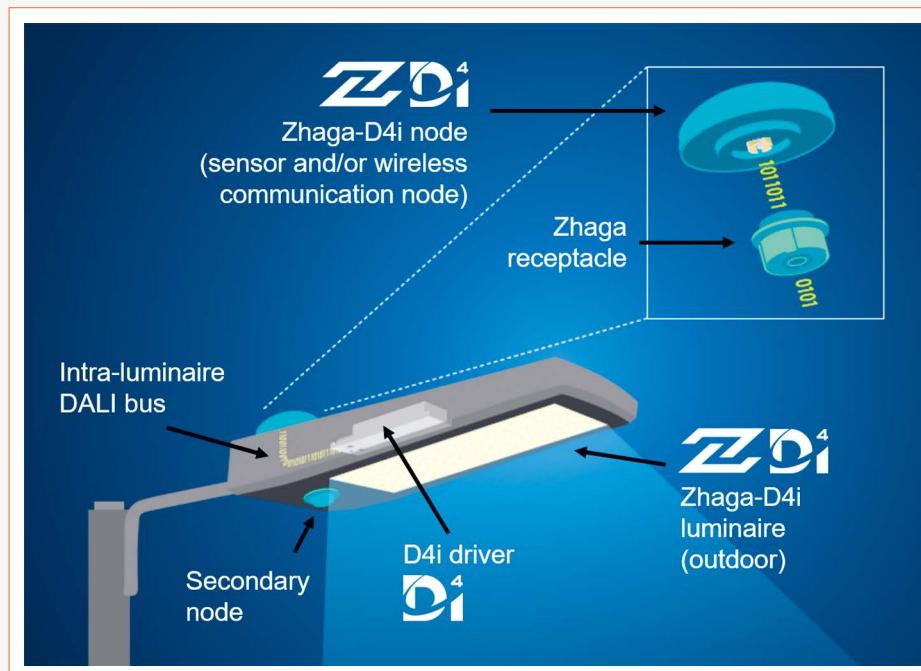
sensors and/or communication nodes. The initial focus is on outdoor lighting, with indoor applications being a work in progress.

The standardization effort brings together complementary specifications from the two organizations, which cover mechanical fit, digital communication and power requirements. This ensures plug-and-play interoperability of the luminaires and nodes, backed by the Zhaga-D4i certification program.

Zhaga-D4i certification allows qualifying luminaires and nodes to carry the dual Zhaga and D4i logos,

as shown in the image. This provides a clear indication of plug-and-play interoperability, which is a strong benefit for specifiers, purchasers, installers and end users.

The certification logos are trademarked to prevent misuse, and provide an established brand for product marketing. Certified luminaires and components are available from multiple suppliers, establishing an ecosystem of compatible products. Zhaga-D4i certification ensures that luminaires are future-proof, and will be able to host next-generation Zhaga-D4i nodes.



The important collaboration between two major, innovative lighting-industry organizations, Zhaga and DiiA, led to the new Zhaga-D4i certification program. The new logo indicates plug-and-play interoperability of luminaires, sensors and communication nodes.

## Market Drivers

The cooperation between Zhaga and DiiA is driven by market requirements for smart, interoperable LED luminaires with pluggable IoT connectivity.

A plug-and-play, socket-based connectivity system makes it easy to add or upgrade sensors and/or communication nodes, which in turn enables luminaires to keep pace with rapid developments in digital networking and sensing technology. By replacing the node rather than the entire luminaire, the luminaire is future-proofed. Also, where the node allows wireless communication, this facilitates the connection of the luminaire to an external lighting-control network. Other functionalities beyond lighting can also be supported.

In addition, the use of intelligent DALI-2 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, or fault detection, or many other parameters. In turn, this can result in significant cost savings in terms of energy efficiency and maintenance.

## Complementary Specifications

The already-published Zhaga Book 18 Edition 1.0 specification defines the mechanical fit and electrical pins for a connectivity system for outdoor LED luminaires. An extensive overview of this specification has been presented in a previous article [1]. The Zhaga connector allows sensors and/or communication nodes with a standardized Zhaga Book 18 plug to be easily connected to the corresponding receptacle (socket) in the luminaire.

The Zhaga connector makes it easy to add or change sensors and/or communication nodes, and to upgrade the luminaire during its lifecycle. However, for full plug-and-play interoperability, as well as enabling luminaire features such as intelligent interaction with external networks, the connectivity system also needs to take care of power and lighting-control requirements.

A solution is provided by the D4i specifications for intra-luminaire DALI, which have been published by DiiA. D4i represents a specific set of features associated with DALI-2 certification. The upcoming Edition 2.0 of Zhaga Book 18 references these D4i specifications. As the name suggests, intra-luminaire DALI refers to a DALI bus within an individual luminaire. The bus connects the LED drivers inside the luminaire with any DALI control devices, for example a sensor or an application controller. As well as providing power to the LEDs, a D4i driver has an integrated bus power supply that can drive the other DALI components.

In the Zhaga-D4i case, each receptacle on the luminaire is connected to the internal DALI bus. When a node is plugged into the receptacle, this establishes bi-directional interaction between the node and the D4i driver(s) using the well-established and standardized DALI-2 protocol.

The D4i specifications ensure that power is available to the luminaire's Zhaga receptacle. In addition to the integrated DALI bus power supply, each Zhaga-D4i certified luminaire also includes a 24V auxiliary power supply (which can be part of the driver or a separate component inside the luminaire).

## Smart D4i Drivers

But the D4i specifications go further, by standardizing the storage and retrieval of data in the DALI memory banks of a D4i driver. The Part 251 specification describes how to store luminaire-specific information that has no impact on the functionality of the driver. For example, a manufacturer can encode data about the luminaire - such as part number, or nominal light output - in the factory. When the luminaire is installed, the data is readily available to the lighting-control network. A utility company or lighting-installation owner could use this capability to monitor and manage their lighting assets accurately and efficiently.

The Part 252 specification standardizes the storage and reporting of data relating to the driver's usage of energy and power. Meanwhile, Part 253 focuses on diagnostics

and maintenance, and covers a wide variety of data related to the driver, light source and luminaire.

## Certification Program

Later this year, Zhaga-D4i certification will be available for LED luminaires that have a powered Zhaga Book 18 receptacle and use D4i drivers inside. Likewise, it will be possible to certify Zhaga-D4i nodes i.e. sensors and/or communication devices with a Zhaga Book 18 plug and D4i compatibility.

Zhaga-D4i certification for luminaires will be granted after a Zhaga test centre has confirmed compliance with the interoperability requirements of Zhaga Book 18. One of the key criteria is the availability of power to the socket. Zhaga will also check that all drivers inside the luminaire are already D4i-certified. A certified Zhaga-D4i luminaire will be eligible to carry the dual Zhaga and D4i logos, and will be listed in the public database on the Zhaga website.

For a Zhaga-D4i node, the first step is for the manufacturer to achieve D4i certification as part of the DALI-2 certification program operated by DiiA. DALI-2 certification requires the manufacturer to submit test results to the DiiA website; certification is granted after the test results are verified. If a DALI-2 control device or driver has successfully implemented all the features required by D4i, then the D4i logo will be permitted on the product. All D4i certified products will be listed in the DiiA product database. After D4i certification, a node with a Zhaga plug can be submitted to a Zhaga test centre, where Zhaga-D4i certification is confirmed.

Speakers from Zhaga and DiiA will give progress updates on the Zhaga-D4i certification program at the LED professional Symposium and the DALI Summit 2019 (September 24-26 in Bregenz, Austria). ■

## References:

- [1] Zhaga Enables Mechanical IoT-Upgradability for Outdoor LED Lighting Fixtures, LED professional Review issue 69, Sept/Oct 2018, p42: <https://bit.ly/2uE0Zf2>

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