The new Zhaga-D4i interface standards for smart luminaires
Smart, future-proof LED luminaires with IoT connectivity

**Connected:** Able to participate in the IoT

**Future-proof:** Easily upgraded to keep pace with rapid developments in digital networking technology

**Standardized:** Certified solutions with plug-and-play interoperability

**Intelligent:** Able to collect and report a wide variety of data

**Beyond lighting:** Supporting sensing and communication applications

Beyond lighting: Supporting sensing and communication applications
Overview – market drivers and solution

Market requirement: Smart, future-proof LED luminaires with IoT connectivity

Solution: The **Zhaga-D4i interface standard**
   → A simple way to add sensors and/or wireless communication nodes to luminaires, with plug-and-play interoperability

• Zhaga and DiiA have collaborated to develop a standardized interface between luminaires and sensors and/or communication nodes:
   – Combining complementary specifications for mechanical fit, digital communication and power
   – Offering Zhaga-D4i certification to ensure plug-and-play interoperability
   – Focusing initially on outdoor lighting, with indoor being a work-in-progress
Zhaga-D4i interface for outdoor luminaires
• Book 20 includes four different categories for the mechanical interface
Features of Zhaga-D4i interface standard

• Easy to add or upgrade sensors and/or communication nodes:
  – Enables future-proof luminaires that can keep pace with rapid developments in digital networking and sensing technology.

• Intra-luminaire DALI-2 bus:
  – Enables bi-directional interaction between sensors and/or communication nodes and LED drivers using the well-established and standardized DALI protocol.

• D4i drivers are smart:
  – Able to report operational and diagnostic data to an external network, and can provide inventory-related information about the luminaires.

• IoT connectivity:
  – With a suitable wireless communication node, the luminaire is able to interact with an external lighting-control network, and to participate in the IoT.
Complementary specifications

D4i specifications from DiiA

DALI Part 250: Integrated bus power supply
DALI Part 251: Luminaire data
DALI Part 252: Energy data
DALI Part 253: Diagnostics data
DALI Part 351: Luminaire-mounted control devices
DALI Part 150: AUX power supply

Book 18 & Book 20 specifications from Zhaga

Book 18 for outdoor:
Book 20 for indoor:
- Mechanical interfaces
- Electrical pin assignment (Book 18)
- Electrical connectors (Book 20)
- References to D4i specs for power & control, and luminaire tests
D4i specifications for intra-luminaire DALI

- **DALI Part 150**: (AUX power supply)
- **DALI Part 250**: (integrated bus power)
- **DALI Parts 251-3**: (data for enhanced asset tracking & performance monitoring)

**DALI-2 LED driver with integrated bus power supply** and **Smart Data**

* AUX can be in the driver, or implemented in a separate product

**Remote lighting-control network**

**Sensor and/or wireless communication node**

**Optional AUX supply**

**Power**

**Data**

**Intra-luminaire DALI bus**

**LEDs**

**Sensor node**

**DALI Part 351** (luminaire-mounted control devices)

**DALI Part 351**

**Luminaire**

**Digital Illumination Interface Alliance**

**ZHAGA Consortium**
Zhaga-D4i certification: Overview

- **Zhaga-D4i certification**: A joint program from Zhaga and DiiA
  - Certification for interoperable luminaires and sensors and/or communication nodes

- Based on **complementary specifications** from Zhaga and DiiA
  - Zhaga Books 18 & 20, plus D4i specifications from DiiA

- Product certification enables use of Zhaga and D4i logos
  - For **luminaires**, **sensors** and **communication nodes**
  - Logo indicates multi-vendor **product interoperability**

- Initial focus on **outdoor lighting** (Book 18), **indoor** solutions now added (Book 20)

- LED drivers are eligible for D4i certification from DiiA
Outdoor luminaire with Zhaga receptacles

Communication node or sensor with Zhaga Book 18 plug

Zhaga Book 18 receptacle

Intra-luminaire DALI bus

AUX supply

D4i driver

LEDs

Second Book 18 node (e.g. sensor)
## Scope of Zhaga–D4i certification

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Certification Details</th>
</tr>
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<tbody>
<tr>
<td>Zhaga-D4i Node</td>
<td>Sensor and/or communication node with a Zhaga plug and D4i compatibility</td>
<td>D4i certification by DiiA. Zhaga-D4i certification by Zhaga</td>
</tr>
<tr>
<td>Zhaga-D4i Luminaire</td>
<td>Has a powered Zhaga socket and contains a D4i driver</td>
<td>Certification issued by Zhaga</td>
</tr>
<tr>
<td>D4i Driver</td>
<td></td>
<td>Certification issued by DiiA (as part of DALI-2 certification)</td>
</tr>
<tr>
<td>Zhaga Connector</td>
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1. Zhaga-D4i Node = sensor and/or communication node with a Zhaga plug and D4i compatibility
2. Zhaga-D4i Luminaire = has a powered Zhaga socket and contains a D4i driver
### Scope of Zhaga–D4i certification

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<th>Component</th>
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Zhaga-D4i certification for outdoor luminaires
Zhaga-D4i certification for indoor luminaires

- Zhaga-D4i luminaire
- Zhaga-D4i sensing and/or wireless communication module
- Intra luminaire DALI bus
- D4i driver(s)
- Zhaga connectors
Zhaga-D4i certification: Benefits

• Certification gives confidence for interoperability
  – Certification carried out by independent authority
  – Certified products are traceable in public databases
  – Certification logos are trademarked to prevent misuse

• Certification gives business advantages
  – Certified luminaires and components are available from multiple suppliers
  – Certification logos provide an established brand for product marketing

• Certification ensures that luminaires are:
  – Future-proof
  – Will be able to host next-generation Zhaga-D4i nodes
Zhaga-D4i certification: Progress

• **Luminaires:** Zhaga-D4i certification launched in **November 2019**
  – Zhaga-D4i certified luminaires are listed on the [Zhaga website](https://zhaga.org)
  – Luma Gen2 from Signify (top), Izylum from Schréder (bottom)

• **Nodes:** Zhaga-D4i certification is expected to launch in 2020

• Zhaga-D4i certification is available by the Zhaga Consortium to its Regular and Associate members

• D4i certification of LED drivers is available by DiiA to its members
  – D4i-certified products are listed on [DiiA website](https://www.diiainc.org)

• The Zhaga logo and the D4i logo are separate logos with separate trademarks. Usage is controlled by Zhaga and DiiA, respectively.
Certification Process: Book 18 Zhaga-D4i Node

 Organisation | Process | Comment
---|---|---
Associate or regular membership of DiiA is required | ![Document icon] | Product self tested or tested by DiiA test house
Associate or regular membership of Zhaga is required | ![Document icon] | Submit results to DiiA for verification and D4i certification
| ![Document icon] | Submit product documentation to Zhaga Test Centre
| ![Document icon] | Tested for compliance against Zhaga specifications
| ![Document icon] | Product awarded Zhaga-D4i certification and use of Zhaga and D4i logos
Certification Process: Zhaga-D4i Luminaires

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For more information

On the Zhaga website:
• [Book 18](#)
• [Book 20](#)

On the DiiA website:
• [Zhaga-D4i](#)
• [D4i specifications](#)

On LinkedIn:
• [#Zhaga_D4i](#)