The new Zhaga-D4i interface standard for smart luminaires

May 2019
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
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

Zhaga-D4i node (sensor and/or wireless communication node)

Zhaga receptacle

Intra-luminaire DALI bus

Second node

D4i driver

Zhaga-D4i luminaire (outdoor)
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 for asset management.
DALI Part 252: Energy reporting for drivers.
DALI Part 253: Diagnostics & maintenance data for drivers.
AUX power-supply specification.

Book 18 specification from Zhaga:
Focus on outdoor lighting.
Ed 1.0 defines mechanical interface and electrical pin assignment.
Ed 2.0 adds references to D4i specifications for power and control, as well as luminaire tests.
D4i specifications for intra-luminaire DALI

* Auxiliary (AUX) power supply can be in a driver, or implemented in a separate product.

**D4i LED driver with integrated bus power supply & data capabilities**

**Power**

**Data**

**Remote lighting-control network**

**Sensor and/or wireless communication node**

**Intra-luminaire DALI bus**

**Luminaire**

**Optional AUX supply**

**AUX** power supply

DALI Part 250 (integrated bus power supply)

DALI Parts 251-3 (operational & diagnostic data)

www.dali2.org/d4i
New: Zhaga-D4i certification

- **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 **Book 18** plus D4i specifications from DiiA

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

- Initial focus on **outdoor lighting**
  - Indoor solutions will also be developed

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

Sensor and/or communication node with Zhaga Book 18 plug

Zhaga Book 18 receptacle

Intra-luminaire DALI bus

AUX supply

D4i driver

LEDs

Second Book 18 node
## Scope of Zhaga–D4i certification

<table>
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<tr>
<th>Zhaga-D4i Node(^1)</th>
<th>Zhaga and D4i logos</th>
<th>Certification issued by Zhaga</th>
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<tr>
<td>Zhaga-D4i Luminaire(^2)</td>
<td>Zhaga and D4i logos</td>
<td>Certification issued by DiiA as part of DALI-2 certification</td>
</tr>
<tr>
<td>D4i Driver</td>
<td>D4i logo</td>
<td></td>
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</tbody>
</table>

\(^1\) Zhaga-D4i Node = sensor and/or communication node with a Zhaga Book 18 plug and D4i compatibility

\(^2\) Zhaga-D4i Luminaire = has a powered Zhaga Book 18 socket and contains a D4i driver
Zhaga-D4i certification for outdoor luminaires

Zhaga-D4i node (sensor and/or wireless communication node)

Zhaga receptacle

Intra-luminaire DALI bus

Second node

D4i driver

Zhaga-D4i luminaire (outdoor)

Zhaga-D4i certification for outdoor luminaires
Benefits of Zhaga-D4i certification

- Certification gives confidence for interoperability
- Certified luminaires and components are available from multiple suppliers
- Certified products are traceable in public databases
- Certification logos are trademarked to prevent misuse
- Certification logos provide an established brand for product marketing
- Certification ensures that luminaires are future-proof and will be able to host next-generation Zhaga-D4i nodes
Zhaga-D4i certification details

- Zhaga-D4i certification is expected to launch in the **third quarter of 2019**

- Zhaga-D4i certification will be made available by the Zhaga Consortium to its Regular and Associate members
  - Zhaga-D4i certified products will be listed on the Zhaga website

- D4i certification will be made available by DiiA to its members
  - D4i certified products will be listed on the DiiA website

- The Zhaga logo and the D4i logo are separate logos with separate trademarks. Usage is controlled by Zhaga and DiiA, respectively.
Certification process: Zhaga-D4i luminaire

1. Complete product or product information submitted to Zhaga test centre
   - Test compliance with Zhaga specs
   - Check that all drivers are D4i-certified

2. Product is certified by Zhaga
   - Certified products listed on Zhaga website

3. Zhaga-D4i certification enables use of Zhaga and D4i logos, on product and product literature
Certification process: Zhaga-D4i node

1. DiiA member (or DiiA test-house) tests the product
2. Results verified by DiiA. Product certified by DiiA
3. Certification allows use of DALI-2 and/or D4i trademark logos
   - Certified product listed in DiiA product database
4. Complete product or product information submitted to Zhaga test centre
   - Test compliance with Zhaga specs
   - Check product is already D4i certified
5. Product is certified by Zhaga
6. Zhaga-D4i certification enables use of Zhaga and D4i logos, on product and product literature
Further background

• May 2019: Zhaga and DiiA unveil joint Zhaga-D4i certification program
  – Joint press release: Link to DiiA website Link to Zhaga website
  – Article from LED Professional (follow links above)

• May 2019: D4i brings standardization to intra-luminaire DALI
  – DiiA press release: Link

• February 2019: Zhaga confirms plan to transfer Book 18 to IEC
  – Zhaga press release: Link

• January 2019: Zhaga and DiiA agree joint certification program for a smart luminaire interface
  – Joint press release: Link