How to get Zhaga-D4i certification for luminaires, sensors and communication nodes

Webinar: 18th February 2021
Welcome to the Zhaga-D4i webinar

• Presentations will last for 40-45 minutes

• Followed by a Q&A session

• Please type questions into the “Q&A” box on your screen

• Presentation materials and a webinar recording will be available after the event
  – www.dali-alliance.org/zhaga-d4i
  – www.zhagastandard.org

• We will also provide written answers to all questions
Agenda

Introduction

Scott Wade
Technical & Certification Manager, DALI Alliance

Dee Denteneer
Secretary General, Zhaga Consortium

Jacob Nuesink
Business Development Manager, DEKRA Certification B.V.

Q&A
Zhaga-D4i certification for outdoor luminaires

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

Zhaga receptacle

Intra-luminaire DALI bus

D4i driver

Second node

Zhaga-D4i luminaire (outdoor)
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

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

**Intelligent:** Able to collect and report a wide variety of data
Zhaga-D4i certification: Benefits

- Certification increases confidence in interoperability
  - Certification carried out by independent organizations
  - Certified products are traceable in public databases
  - Certified luminaires & components from multiple suppliers

- Use of logos on certified products:
  - Logos are trademarked to prevent misuse
  - Logos widely recognized in the market

- Zhaga-D4i certification ensures:
  - Future-proof luminaires
  - Availability of luminaire, energy & diagnostics data
  - Plug-and-play interoperability
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Q&A
Questions?

- Please type your questions into the Q&A box

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D4i
Products, testing & certification
Scott Wade, DALI Alliance
18th February 2021
Agenda

Part 1: DiiA & D4i

- Introduction: DALI, DALI-2, D4i and the DALI Alliance
- Trademarks
- D4i requirements
- Testing
- Certification

Scott Wade,
Technical & Certification Manager,
DALI Alliance
DALI – The basics

- DALI® is the industry-standard protocol (language) for bi-directional, digital communication between lighting-control devices.
  - Dedicated to lighting, with a rich feature set

- DALI is technically managed in the open, global standard IEC 62386.

- DALI-2™ is the latest version of the DALI protocol.

- DALI-2 and D4i certification is driven by DiiA, the global DALI alliance.
  - Ensures interoperability through testing and certification with trademark use

- DALI, DALI-2 and D4i trademarks are controlled by DiiA.
The DALI Alliance

- The DALI Alliance (DiiA) is an open, global consortium of lighting companies that aims to grow the market for lighting-control solutions based on DALI.

- Also known as Digital Illumination Interface Alliance

- More than 260 members worldwide.
  - Industry leaders in lighting and control

- Membership allows certification or registration of products:
  - Over 1,600 DALI-2 certified products (including D4i)
  - Over 1,360 DALI version-1 registered products

- Membership allows DALI, DALI-2 and D4i trademark use.
Trademarks

The Trademarks are used by DiiA members:

- The original **DALI** logo is used on *registered* control gear (drivers). These have passed the DALI version-1 tests and are listed on the DALI website.
  - Use for marketing/promotion of DALI technology is also permitted.

- **DALI-2** is used on *certified* products. These have passed the DALI-2 tests, with verification by DiiA before certification is granted. All certified products are listed on the website.

- **D4i** is also used on *certified* products. These have passed the DALI-2 tests, with verification by DiiA. D4i products also include some specific features that are optional for DALI-2.

- Luminaires using **DALI**, **DALI-2** or **D4i** components are also able to use these Trademarks.

- Detailed requirements are given in the *Trademark Guidelines* document.

- The following slides explain the main requirements for D4i control gear, control devices and luminaires.
D4i

D4i is an extension to DALI-2:
- Control gear require a minimum set of functionality for D4i
- Control devices require functionality to aid “plug & play”
  → Especially for intra-luminaire use: DALI is inside the luminaire

Example D4i application: Streetlights
- In collaboration with Zhaga, luminaires meeting the requirements can be Zhaga-D4i certified
- Easy to add or upgrade sensors and/or communication nodes to luminaires
  → Future-proof luminaires that can keep pace with rapid developments in digital networking and sensing technology.
D4i for control gear

• Control gear includes all of the following:
  – IEC 62386 parts 101 and 102
  – LED driver – IEC 62386-207
  – **Switchable bus power supply**, with memory bank – DiiA specification, DALI Part 250
  – Luminaire data – DiiA specification, DALI Part 251
  – Energy Reporting – DiiA specification, DALI Part 252
  – Diagnostics & Maintenance – DiiA specification, DALI Part 253

• Optionally, the control gear can include:
  – AUX power supply – DiiA specification, DALI Part 150
  – Other IEC 62386 parts

• Regular or Associate membership of DiiA is required to allow certification and Trademark use on control gear.
D4i for control devices

Control devices implement the following standard:

- **Luminaire-mounted control devices** – DiiA specification, DALI Part 351

Part 351 describes four types, A-D:

- **A**: Multi-master application **controller**, optionally with a sensor. Externally powered.
  - Typical example: Lighting controller with city-wide communications and light sensor, mounted on the top of a street-light.
  - For Zhaga-D4i, these are powered from the AUX supply that is built into the luminaire/drivers.
- **B**: Multi-master, with an application **controller** and/or **sensor**. Bus-powered or externally powered.
- **C**: Multi-master application **controller**, optionally with a sensor. Bus-powered.
- **D**: **Single-master** application **controller**. Optionally with a sensor. Bus-powered or externally powered. Not intended to be used with other single-master or multi-master control devices.

Some luminaires support two such devices. These could be an A & B (especially outdoor applications) or a C & B (especially indoor applications).

Regular or Associate membership of DiiA is required to allow certification and Trademark use on control devices.
D4i for luminaires

- Luminaires include the following:
  - **Up to 4 LED drivers** meeting the D4i requirements.
  - A **bus power supply** – integrated within D4i drivers.
  - **Basic luminaire information** is pre-programmed into memory bank 1.

- **Optionally**, the luminaires can include:
  - D4i control devices
  - AUX supply (for example: in outdoor applications).
  - Emergency lighting control gear.

- Luminaires need to meet the D4i requirements, to allow the D4i Trademark to be used, but there is no certification of luminaires by DiiA.
- Regular, Associate or Community membership of DiiA is required to allow Trademark use on luminaires.
D4i example: Two-node outdoor luminaire

- **DALI Part 150**: AUX power supply
- **DALI Part 250**: Integrated bus power
- **DALI Parts 251-3**: Data for enhanced asset tracking & performance monitoring

**Diagram Details**:
- **D4i LED driver with integrated bus power supply and DALI data**
- **Optional AUX supply**
- **LEDs**
- **Intra-luminaire DALI bus**
- **Remote lighting-control network**
- **Sensor node**
- **Wireless communication node**

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

- Data for enhanced asset management & performance monitoring
- Data storage in DALI memory banks, with standardized format & locations

DiiA Part 251 – Luminaire Data
- Information about the luminaire (e.g. GTIN, light output, CCT & CRI, light distribution etc) can be stored in the LED driver
- Enables asset management

DiiA Part 252 – Energy Reporting
- Provides real-time power & energy usage for LED drivers

DiiA Part 253 – Diagnostics & Maintenance
- Operating data for control gear and lamps, including failure conditions, run-time data
- Enables predictive maintenance
DALI data: An outdoor lighting example

In the factory:
Luminaire data is programmed into drivers.

During operation:
Performance monitoring
• Energy usage data can be used e.g. for billing

During operation:
Predictive maintenance
• Diagnostics data allows network operator to anticipate need for maintenance
• Repair team has knowledge of location and type of fixture

In the field:
Automated commissioning
• When installed, luminaires can automatically transfer data to a remote network
• Reduces human error, saves installation time and cost
• Operator has a full map of asset information
Testing

- Testing
  - The official DALI testers are the ProbitLab and ProbitLab2 (from Lichtvision)
  - Compliance testing may be carried out by DiiA members, including accredited test-houses

- Test-houses
  - Accredited test-houses are listed on the DiiA website:
  - www.dali2.org/testing/test-houses.html
## D4i and Zhaga–D4i certification

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<th>Zhaga members</th>
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<td><strong>Luminaire</strong></td>
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<td><strong>Connector</strong></td>
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1. D4i certification
2. Zhaga certification

1 + 2 both required