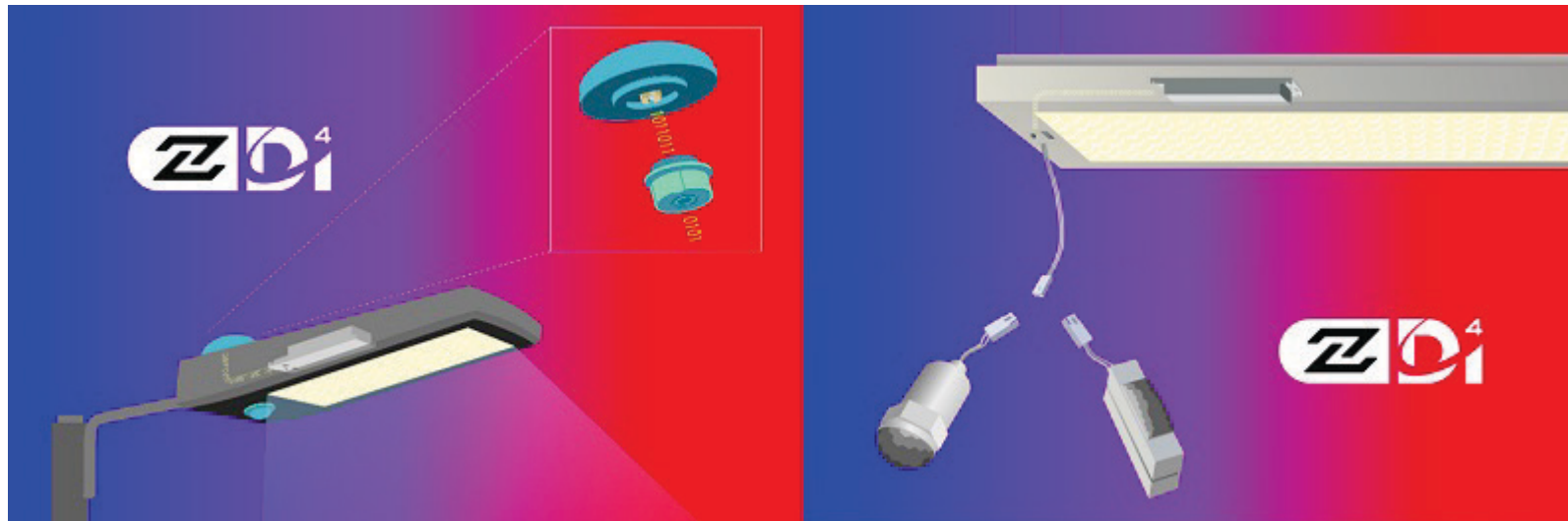# How to get Zhaga-D4i certification for luminaires, sensors and communication nodes

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
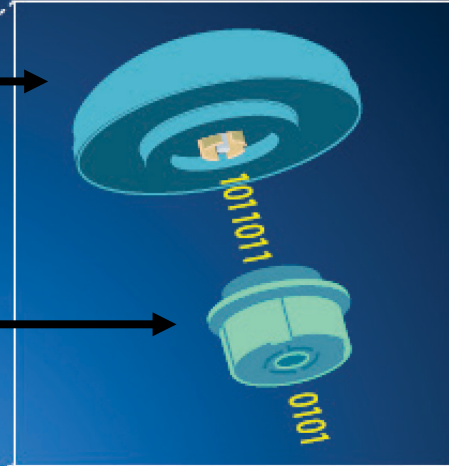Secretary General, Zhaga Consortium

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

Q&A
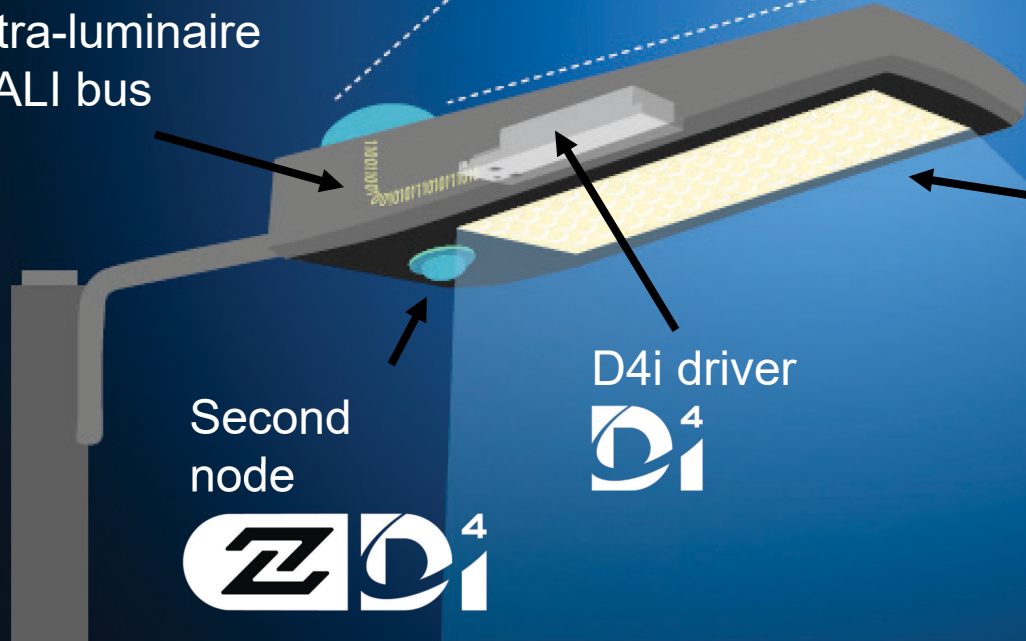
Zhaga-D4i certification for outdoor luminaires

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

Zhaga receptacle

Intra-luminaire DALI bus

Zhaga-D4i luminaire (outdoor)

Second node

D4i driver

DALI Alliance

ZHAGA Consortium

4

Smart, future-proof LED luminaires with IoT connectivity

Connected: Able to participate in the IoT

Beyond lighting: Supporting sensing and communication applications

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

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

Standardized: Certified solutions with plug-and-play interoperability

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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Secretary General, Zhaga Consortium

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Business Development Manager, DEKRA Certification B.V.

Q&A

Questions?

- Please type your questions into the Q&A box

- Contact information:

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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 logo	**D**igital **A**ddressable **L**ighting **I**nterface

- 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.
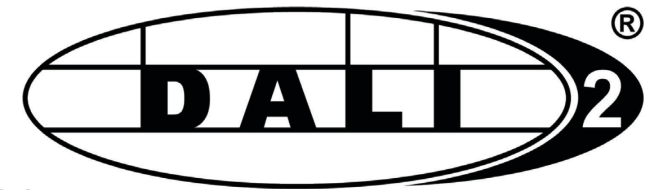
The DALI Alliance

- 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**.

AcuityBrands Acuity Brands Lighting, Inc.	**BEGA** BEGA Gantenbrink-Leuchten KG	**CP electronics** CP Electronics	**DELTA** Delta Electronics, Inc.
ERCO ERCO GmbH	**ESYLUX** ESYLUX GmbH	**Helvar** Helvar Oy Ab	**AUDACY** Ideal Industries, Inc.
LEDVANCE LEDVANCE GmbH	**LEEDARSON** Leedarson IoT Technology Inc.	**LUTRON** Lutron Electronics Co.	**niko** Niko NV
Ex-Or by Honeywell Novar ED&S Ltd. (A Honeywell Company)	**OSRAM** OSRAM GmbH	**Panasonic** Panasonic Corporation	**SIEMENS** Siemens Schweiz AG
Signify Signify Netherlands B.V.	**SILVAIR** Silvair, Inc.	**SIMMTRONIC** Simmtronic Limited	**simon** Simon S.A
steinel STEINEL GmbH	**Synapse** Synapse Wireless	**Telensa** Telensa Ltd	**TRIDONIC** Tridonic GmbH Co Kg.
TRILUX GROUP TRILUX Group (ITZ GmbH)	**VS LIGHTING SOLUTIONS** Vossloh-Schwabe GmbH	**WAGO** WAGO Kontakttechnik GmbH & Co. KG	**zencontrol** Zencontrol Limited

DALI Alliance

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.
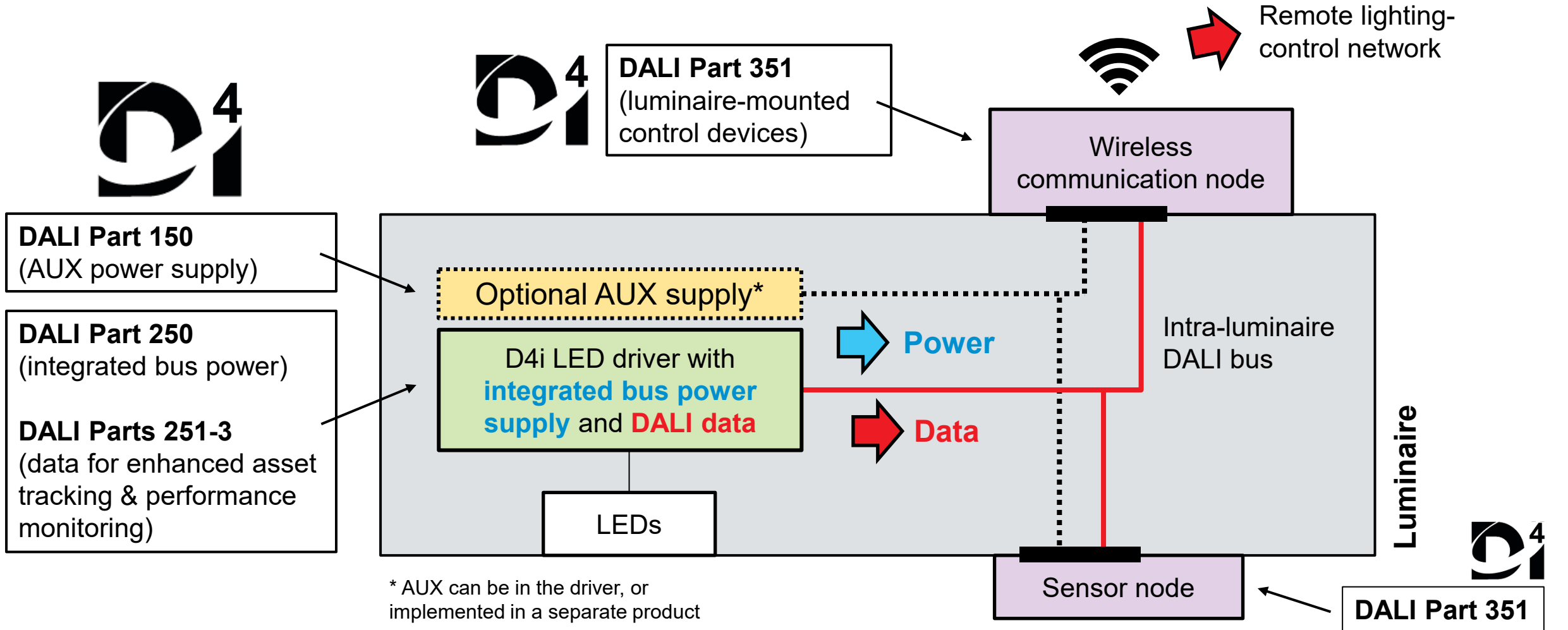
D4i for luminaires

- 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.

DALI Part 351
(luminaire-mounted control devices)

Remote lighting-control network

Wireless communication node

DALI Part 150
(AUX power supply)

DALI Part 250
(integrated bus power)

DALI Parts 251-3
(data for enhanced asset tracking & performance monitoring)

Optional AUX supply*

D4i LED driver with **integrated bus power supply** and **DALI data**

Power

Data

Intra-luminaire DALI bus

LEDs

Luminaire

Sensor node

DALI Part 351

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

DALI Alliance

Data specifications

- Data for enhanced asset management & performance monitoring
- Data storage in DALI memory banks, with standardized format & locations
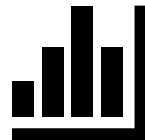
Luminaire Data
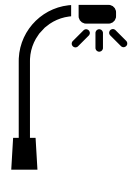
DiiA Part 251 – Luminaire Data
- Information about the luminaire (e.g. GTIN, light output, CCT & CRI, light distribution etc) can be stored in the LED driver
- Enables asset management

Energy Data

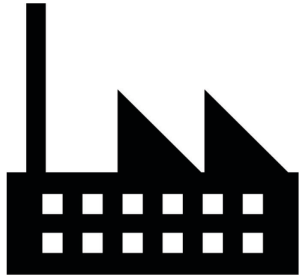**DiiA Part 252 – Energy Reporting**
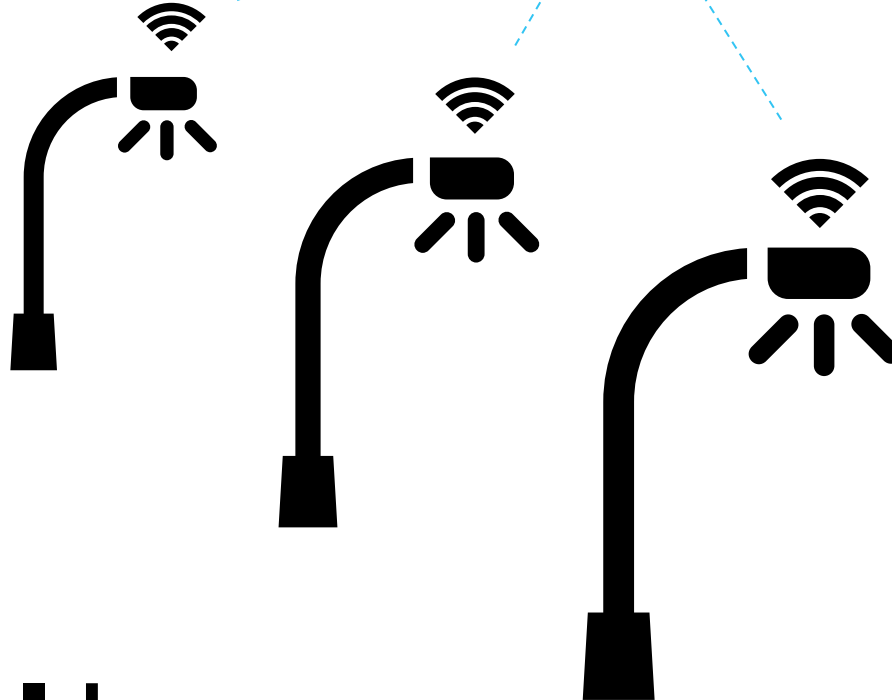- Provides real-time power & energy usage for LED drivers

Diagnostics Data

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

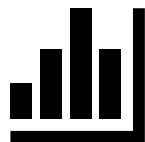# DALI data: An outdoor lighting example

Network

In the factory:
Luminaire data is programmed into drivers.

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

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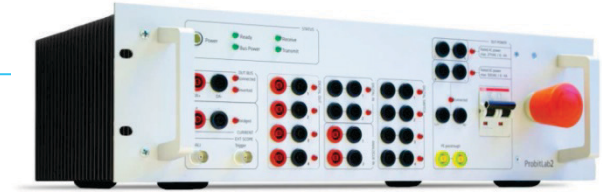• Operator has a full map of asset information

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

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

	DALI Alliance members		Zhaga members	
LED driver	D4i certification →	**D4i**		
Control device	① D4i certification →	**D4i**	② Zhaga certification →	**Z D4i** ① + ② both required
Luminaire	*Trademark usage*	**D4i**	Zhaga certification →	**Z D4i**
Connector			Zhaga certification →	**Z**

DALI® Alliance