The new Zhaga-D4i interface standard for smart luminaires

March 2020

Digital Illumination Interface Alliance

Zhaga

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

Overview – market drivers and solution

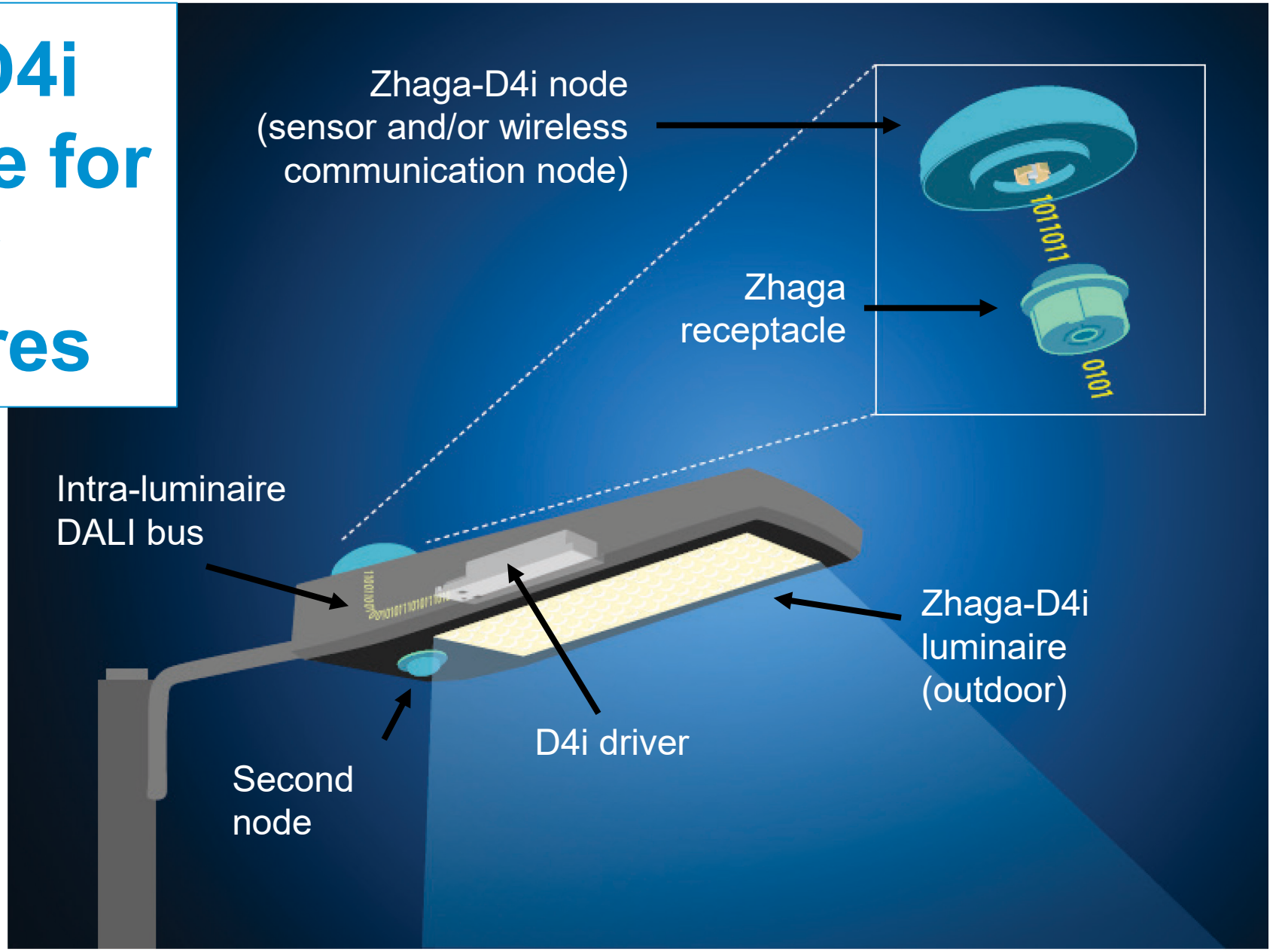
Market requirement: Smart, future-proof LED luminaires with IoT connectivity

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



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
DALI Part 351: Luminaire-mounted control devices
DALI Part 150: 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.

Complementary specifications

D4i specifications from Di
DALI Part 250: In
power su

DiiA Specification	Version
DALI Part 150 – AUX Power Supply	Version 1.1, October 2019
DALI Part 250 – Integrated Bus Power Supply	Version 1.1, October 2019
DALI Part 251 – Memory Bank 1 Extension (luminaire data)	Version 1.1, October 2019
DALI Part 252 – Energy Reporting	Version 1.1, October 2019
DALI Part 253 – Diagnostics & Maintenance	Version 1.1, October 2019
DALI Part 351 – Luminaire-mounted Control Devices – NEW	Version 1.0, October 2019

Zhaga Book 18 Ed. 2.0 has been published

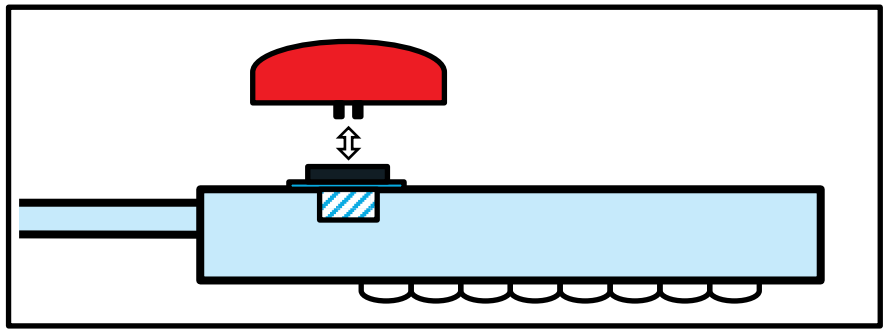
28 November

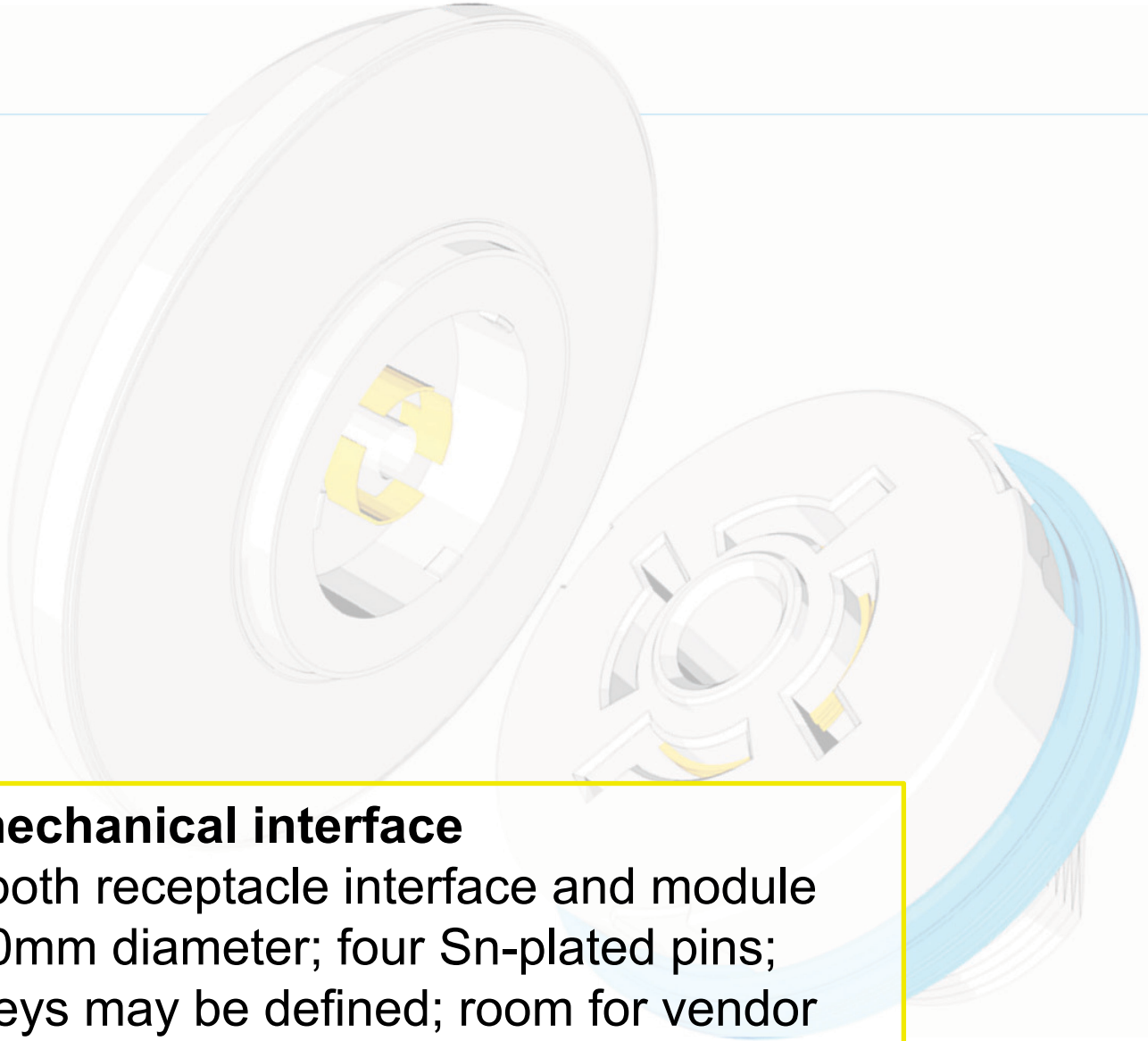
Zhaga member companies can now access the specification and certify luminaires according to the Zhaga-D4i certification program. Dekra and Intertek are the accredited test centres.

See the Press Release

Zhaga Book 18

- Phase 1: completed and published



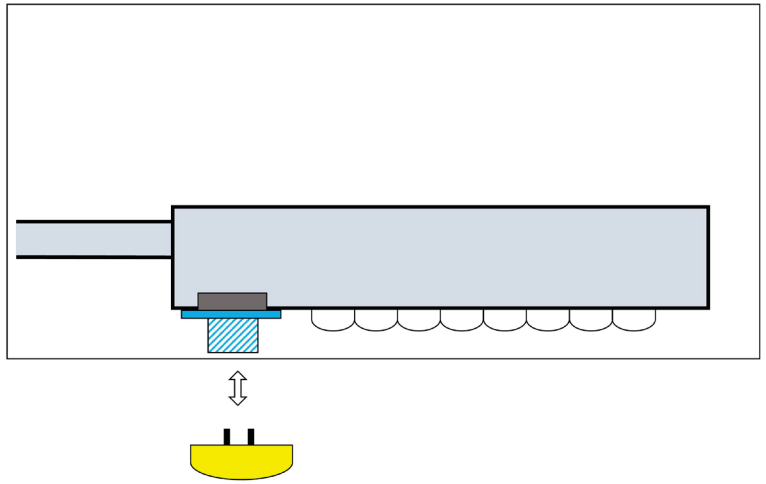


Phase 1: the mechanical interface

Specifying both receptacle interface and module interface; 30mm diameter; four Sn-plated pins; additional keys may be defined; room for vendor differentiation; testing and certification, ….

Zhaga Book 18

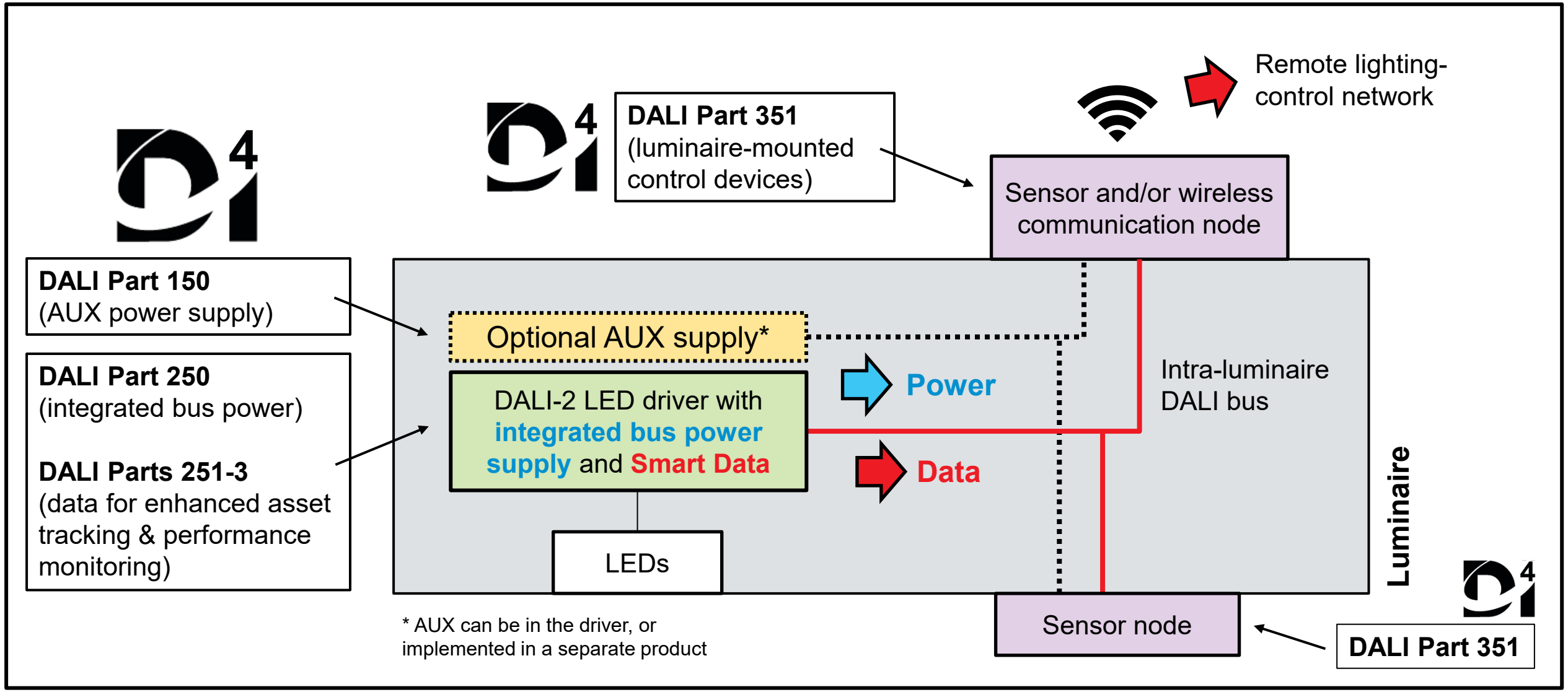
- A great and modern alternative to NEMA for ANSI C136



Specifically developed for LED

- New use cases for motion detection and security
- Small and fit for many designs
- Designed for cost-effective luminaires
- Easy -safe- replace in field
- Low power sensor-module design
- Resolving EMC issues
- Plug-and-play interoperable

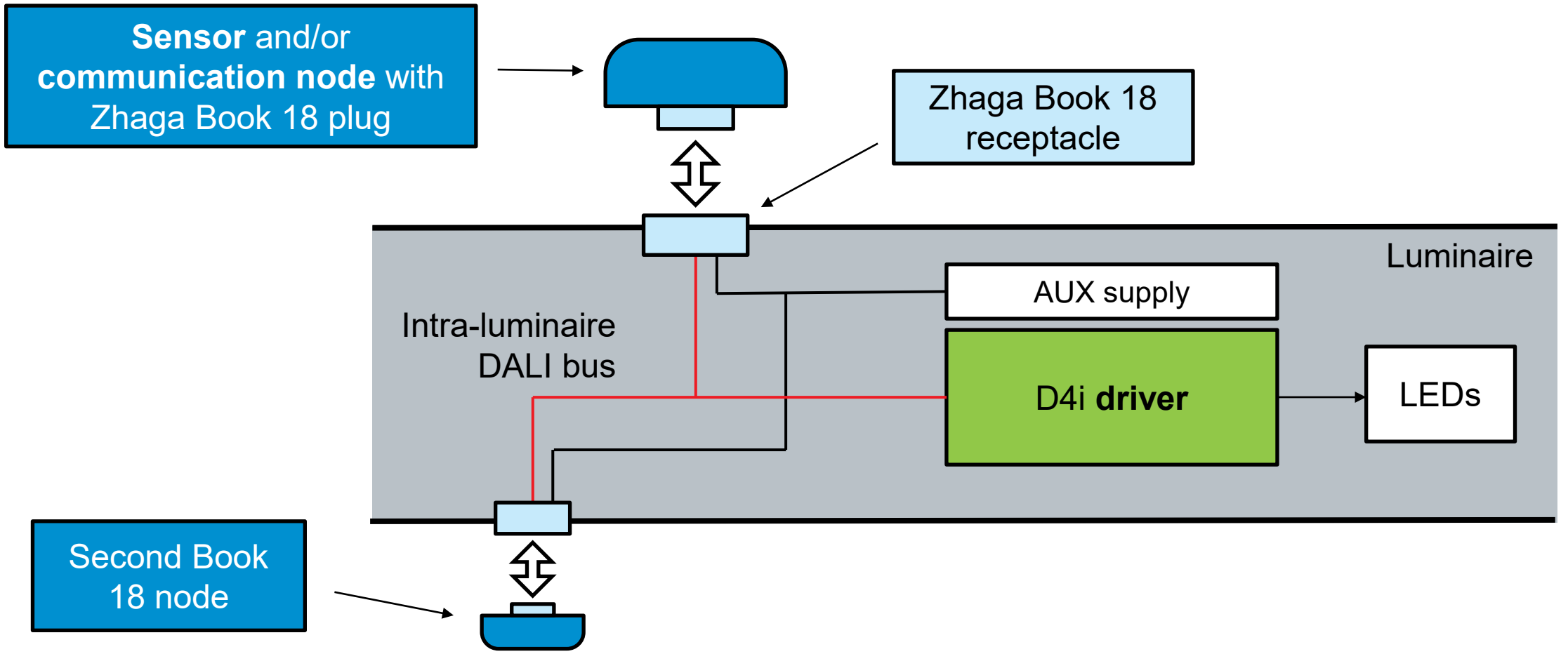
D4i specifications for intra-luminaire DALI



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 enables 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



Scope of Zhaga–D4i certification

Zhaga-D4i **Node**[1]		Zhaga and D4i logos	Certification issued by Zhaga
Zhaga-D4i **Luminaire**[2]		Zhaga and D4i logos	
D4i **Driver**		D4i logo	Certification issued by DiiA (as part of DALI-2 certification)
Zhaga **Connectors** (plug/receptacle)		Zhaga logo	Certification issued by Zhaga

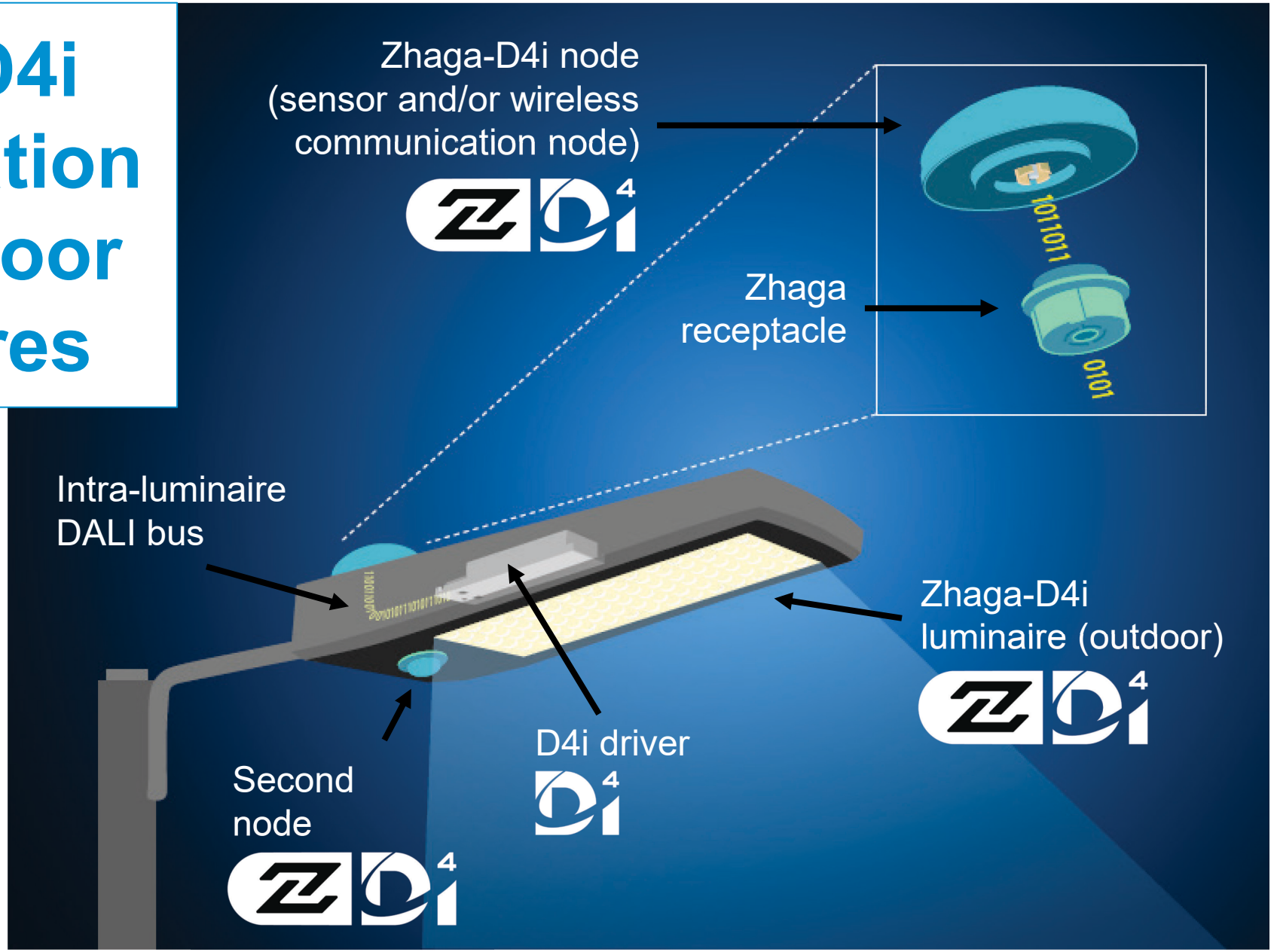
[1] Zhaga-D4i Node = sensor and/or communication node with a Zhaga Book 18 plug and D4i compatibility
[2] Zhaga-D4i Luminaire = has a powered Zhaga Book 18 socket and contains a D4i driver

Scope of Zhaga–D4i certification

Zhaga-D4i **Node**[1]		Zhaga and D4i logos	AVAILABLE Q1 2020
Zhaga-D4i **Luminaire**[2]		Zhaga and D4i logos	AVAILABLE NOVEMBER 2019
D4i **Driver**		D4i logo	AVAILABLE NOVEMBER 2019
Zhaga **Connectors** (plug/receptacle)		Zhaga logo	AVAILABLE July 2018

[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



Benefits of Zhaga-D4i certification

- 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 and will be able to host next-generation Zhaga-D4i nodes

Zhaga-D4i certification: Progress

- Luminaires: Zhaga-D4i certification launched in **November 2019**
  - First Zhaga-D4i certified luminaires are listed on Zhaga website
  - Luma Gen2 from Signify (top), Izylum from Schréder (bottom)

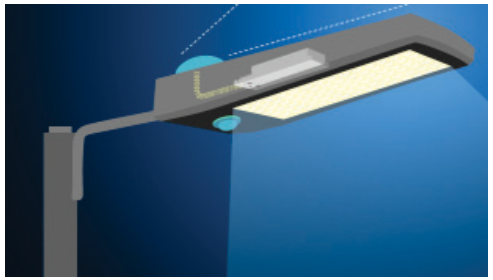
- Nodes: Zhaga-D4i certification is expected to launch in **Q2 2020**

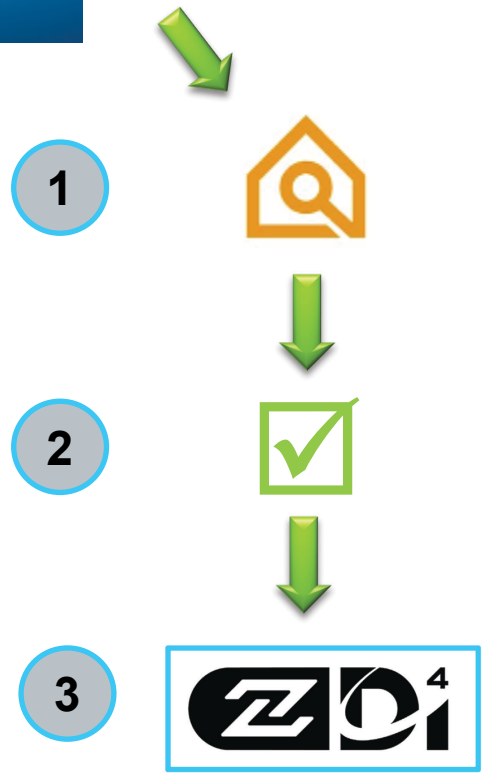
- Zhaga-D4i certification is available by the Zhaga Consortium to its Regular and Associate members

- D4i certification of LED drivers is available by DiiA to its members
  - First D4i-certified products are listed on DiiA website

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

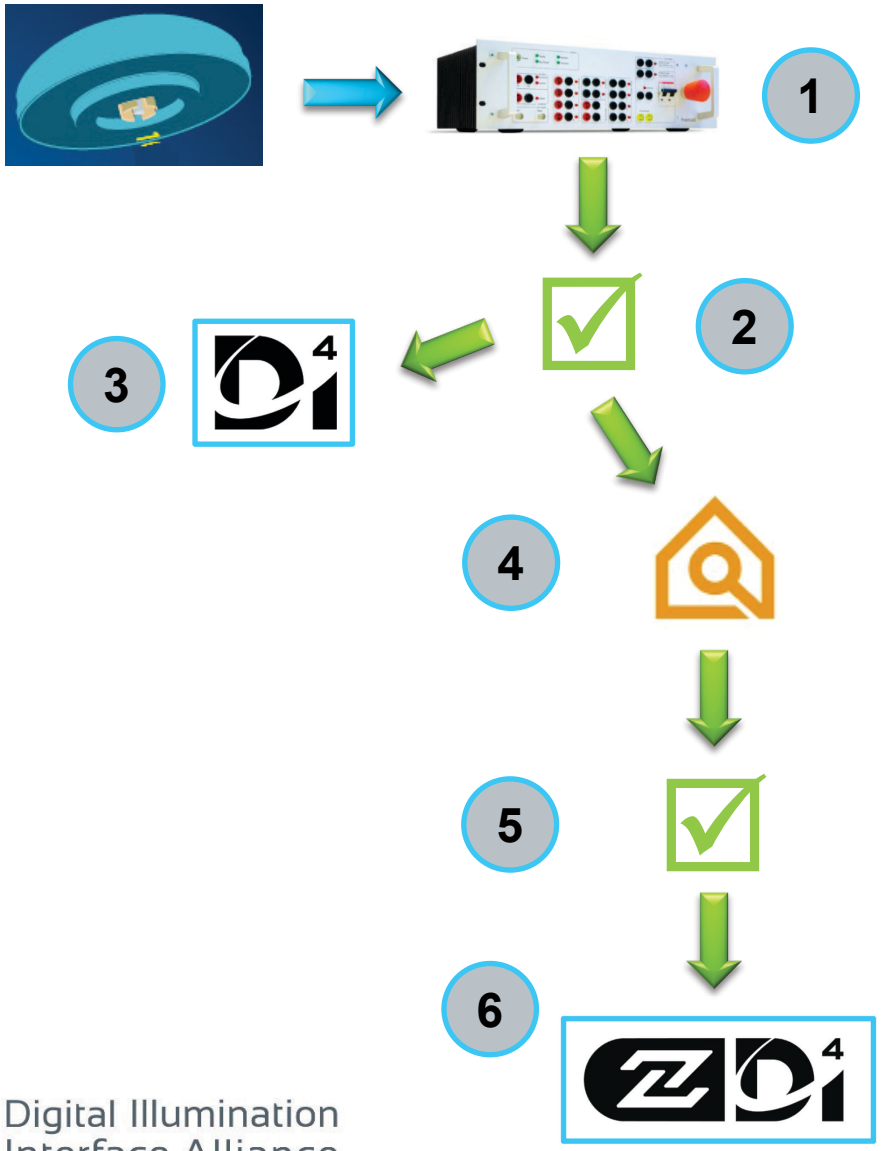
Certification process: Zhaga-D4i luminaire





1. Complete product or product information submitted to Zhaga test centre
   - Test compliance with Zhaga specs
   - Check drivers are listed on DiiA website
   - Check Zhaga connector is 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

Digital Illumination Interface Alliance

Zhaga

Further background

- November 2019: Zhaga Book 18 Ed 2.0 has been published
  - Zhaga press release: Link
- November 2019: DiiA starts D4i certification of LED drivers
  - DiiA press release: Link
- September 2019: Zhaga-D4i interoperability showcased at LpS
  - Joint press release: Link
- May 2019: Zhaga & DiiA unveil joint Zhaga-D4i certification program
  - Joint press release + Article from LED Professional: Link
- May 2019: D4i brings standardization to intra-luminaire DALI
  - DiiA press release: Link
- January 2019: Zhaga and DiiA agree joint certification program for a smart luminaire interface
  - Joint press release: Link