Zhaga standard & Zhaga-D4i interface

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BELGISCH INSTITUUT voor VERLICHTINGSKUNDE
INSTITUT BELGE de l'ECLAIRAGE
CIE NATIONAL COMMITTEE – NBN SECTOR OPERATOR

Agenda

- Introduction to Zhaga Consortium
  - Scope
  - Zhaga Books
- The Zhaga-D4i interface
  - Purpose, architecture and features
  - Focus on Zhaga Book 18 & D4i specifications
- The Zhaga-D4i certification
  - Overview & benefits
  - Zhaga, D4i & ZD4i certifications
- The NEMA and Zhaga architectures

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What is Zhaga ?

An open industry consortium with > 260 members from the lighting industry

ZHAGA Regular Member

ZHAGA Associate Member

ZHAGA Community Member

Please visit zhaga.org

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What is the purpose of Zhaga ?

Create **interface specifications** for **components** of LED luminaires to enable multi-vendor eco-systems of interoperable products

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What is the purpose of Zhaga ?

Create **interface specifications** for **components** of LED luminaires to create trust in **interoperability** through a certification and logo program executed by third party test houses

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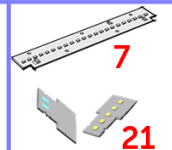
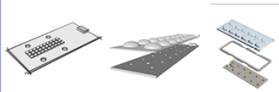
What are Zhaga books ?

Zhaga is creating a series of specifications, known as Books. Each Book defines the interface of one or more components of a LED luminaire. Such components include LED light engines, LED modules, LED drivers, LED arrays, holders, and connectivity fit systems.

Smart Luminaires

Book 1-25
Overview by application

	Office & Industry	Retail & Hospitality	Outdoor
Integrated LED light engines	14 2,8	17 16	
LED modules (non-integrated)	 7 21 14	12 9 5 3,10	 4 15 19
Drivers	LED set 13,22,23,24,25		
Sensor and communication modules	20		18

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What is the Zhaga-D4i interface ?

Outcome of a joint effort between Zhaga and DiiA to define specifications and certification program providing an answer to the need for smart luminaires and connected lighting

→ 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 combined Zhaga-D4i certification to ensure plug-and-play interoperability
- Covering outdoor lighting (Zhaga Book 18) and indoor lighting (Zhaga Book 20)

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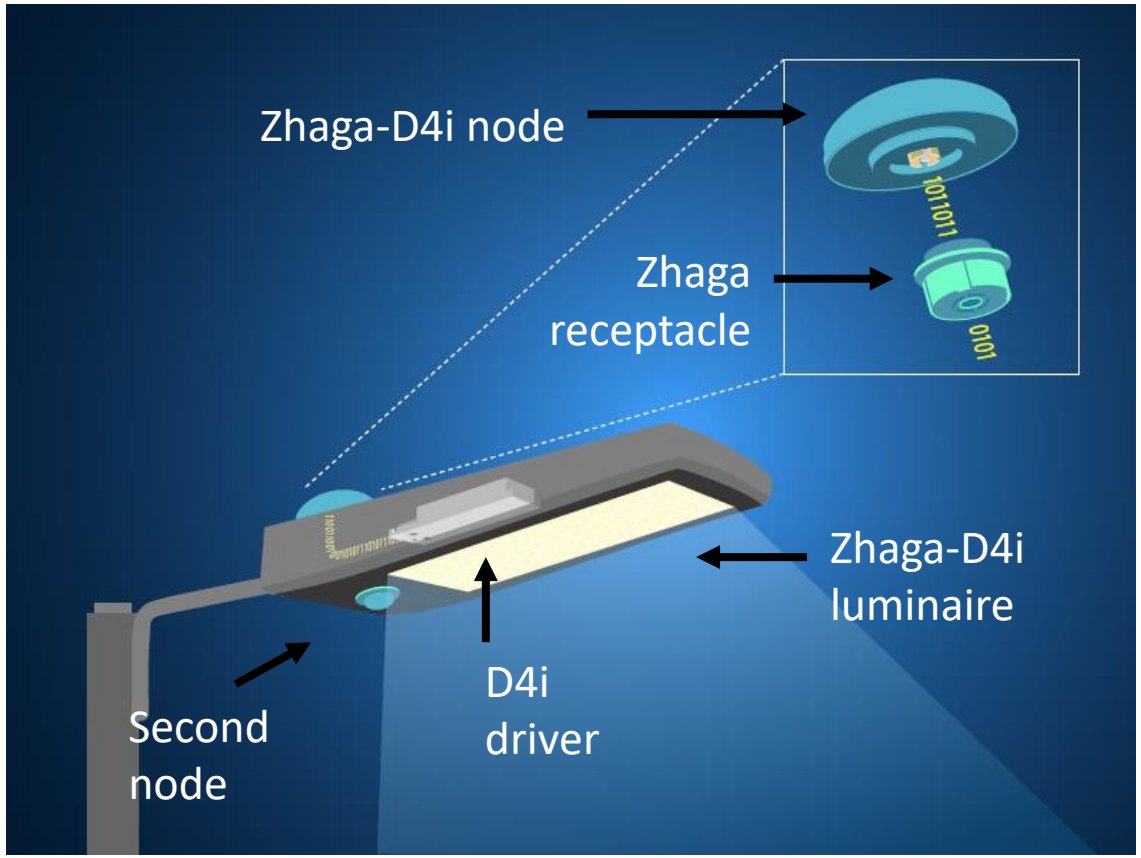
What is the Zhaga-D4i interface ?



Specifications describing interface between luminaire and peripherals (node) in terms of :

- Mechanical
- Electrical
- Digital communication

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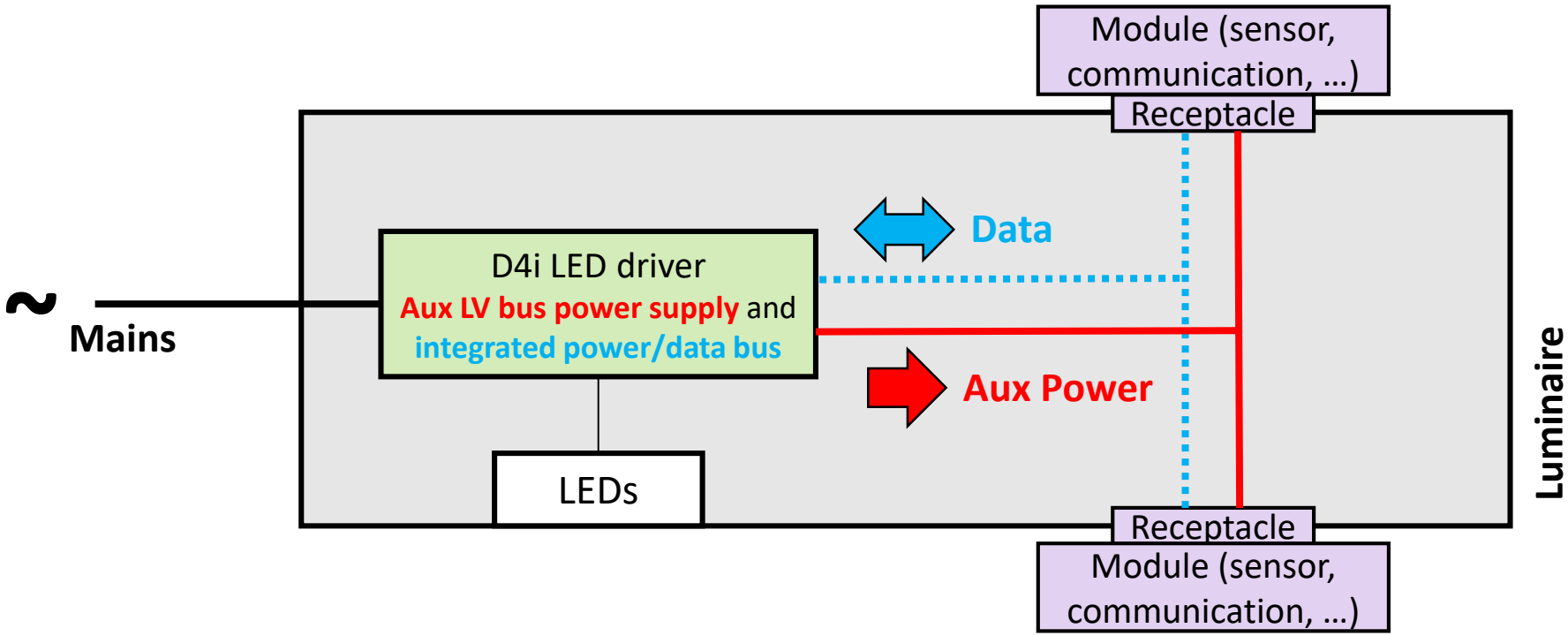
What is the Zhaga-D4i architecture ?



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What are the key features of the ZD4i interface ?

- 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, and to participate in the IoT.
- 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.

How Zhaga and DiiA specs interact ?

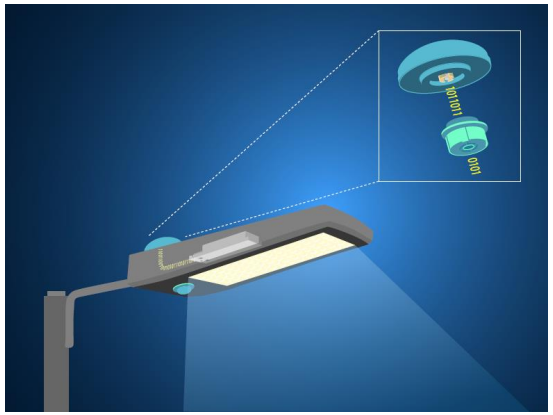
D4i specifications from DiiA

Book 18 & Book 20 specifications from Zhaga

IEC62386 (DALI-2)

+

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



- Mechanical interfaces
- Electrical pin assignment
- References to D4i specs for power & control, and luminaire

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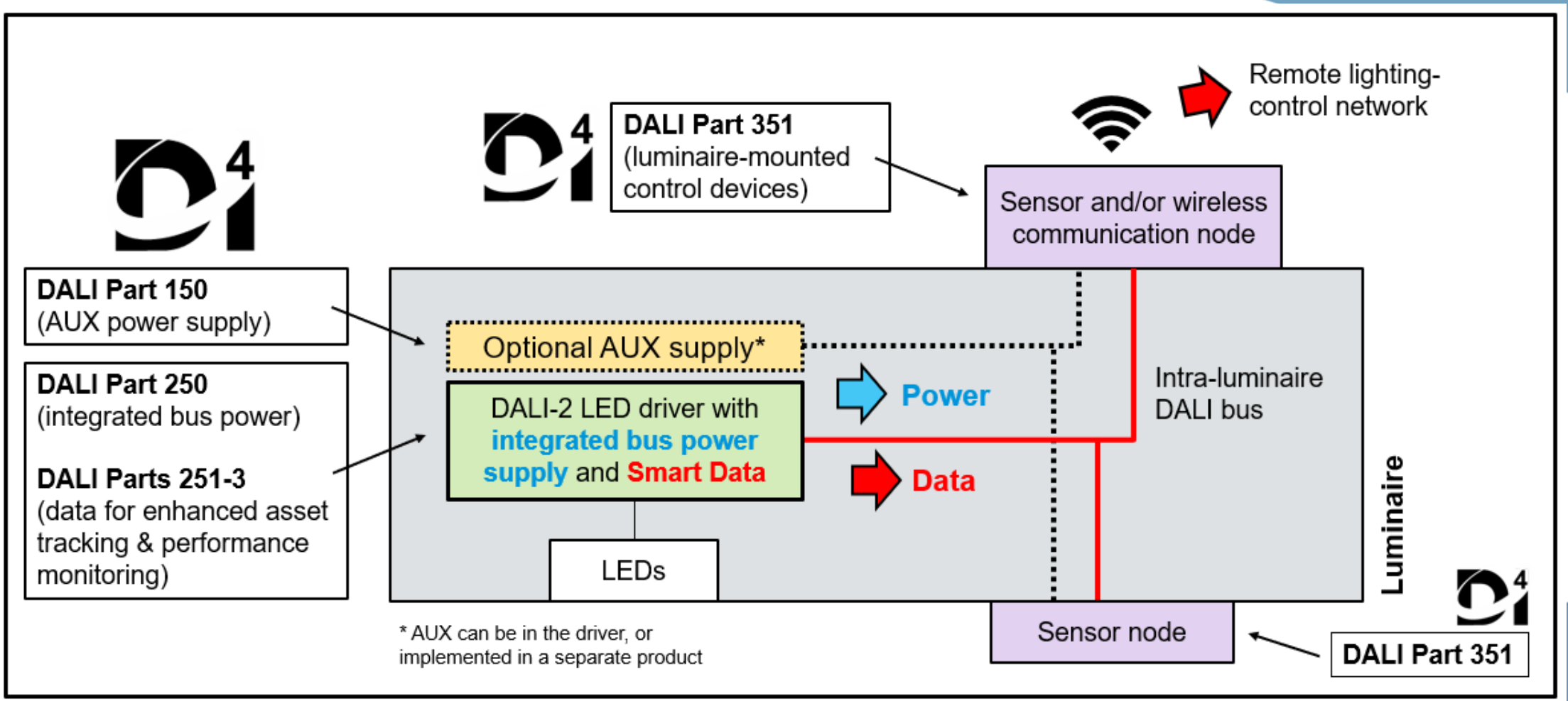
Focus on D4i specs for intra-luminaire DALI



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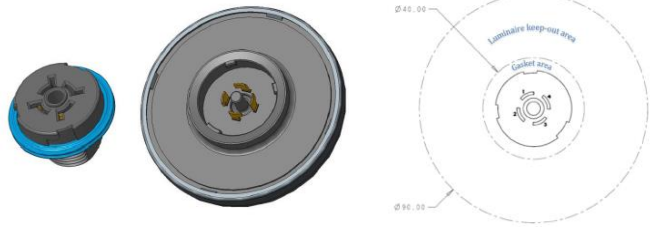
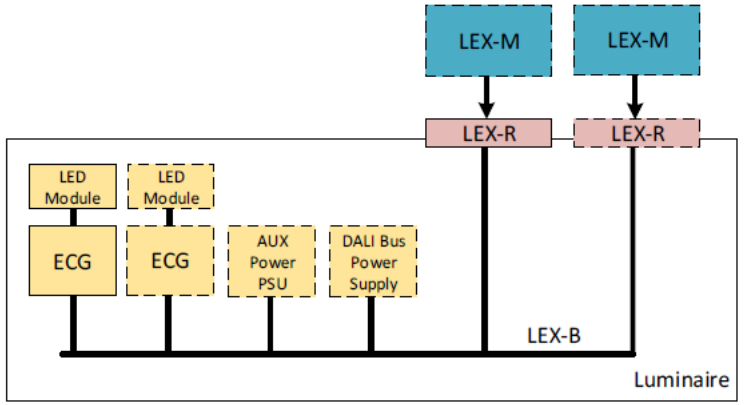
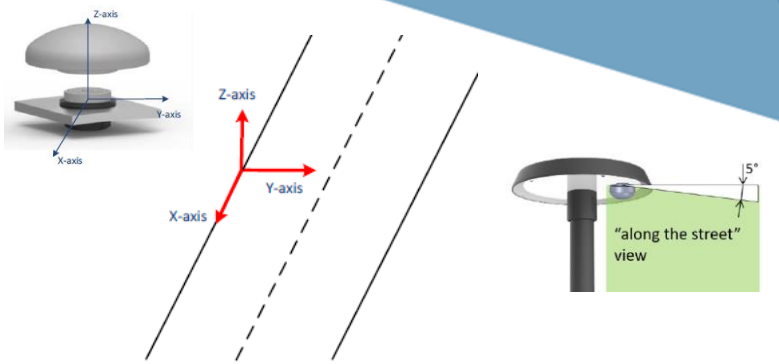
Focus on Zhaga book 18 specs







Mechanical interface

- Dimensions (receptacle, base plate, keep-in & out area, …)
- locking
- Contacts

Electrical & Communication interface

- Pin assignement
- Electrical insulation
- DALI bus/power requirements
- Max number of receptaces/drivers
- Possible combination of nodes

Application guidelines (informative)

- Orientation (top & bottom mounting)
- Viewing angle in case of bottom mounting)

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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**
- LED drivers are eligible for D4i certification from DiiA

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

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Scope of Zhaga-D4i certification

Zhaga-D4i **Node**	Certification issued by DiiA (D4i) and Zhaga	Available Q4/2020
Zhaga-D4i **Luminaire**	Certification issued by Zhaga	✓ → Zhaga website
D4i **Driver**	Certification issued by DiiA	✓
Zhaga **Connector**	Certification issued by Zhaga	✓

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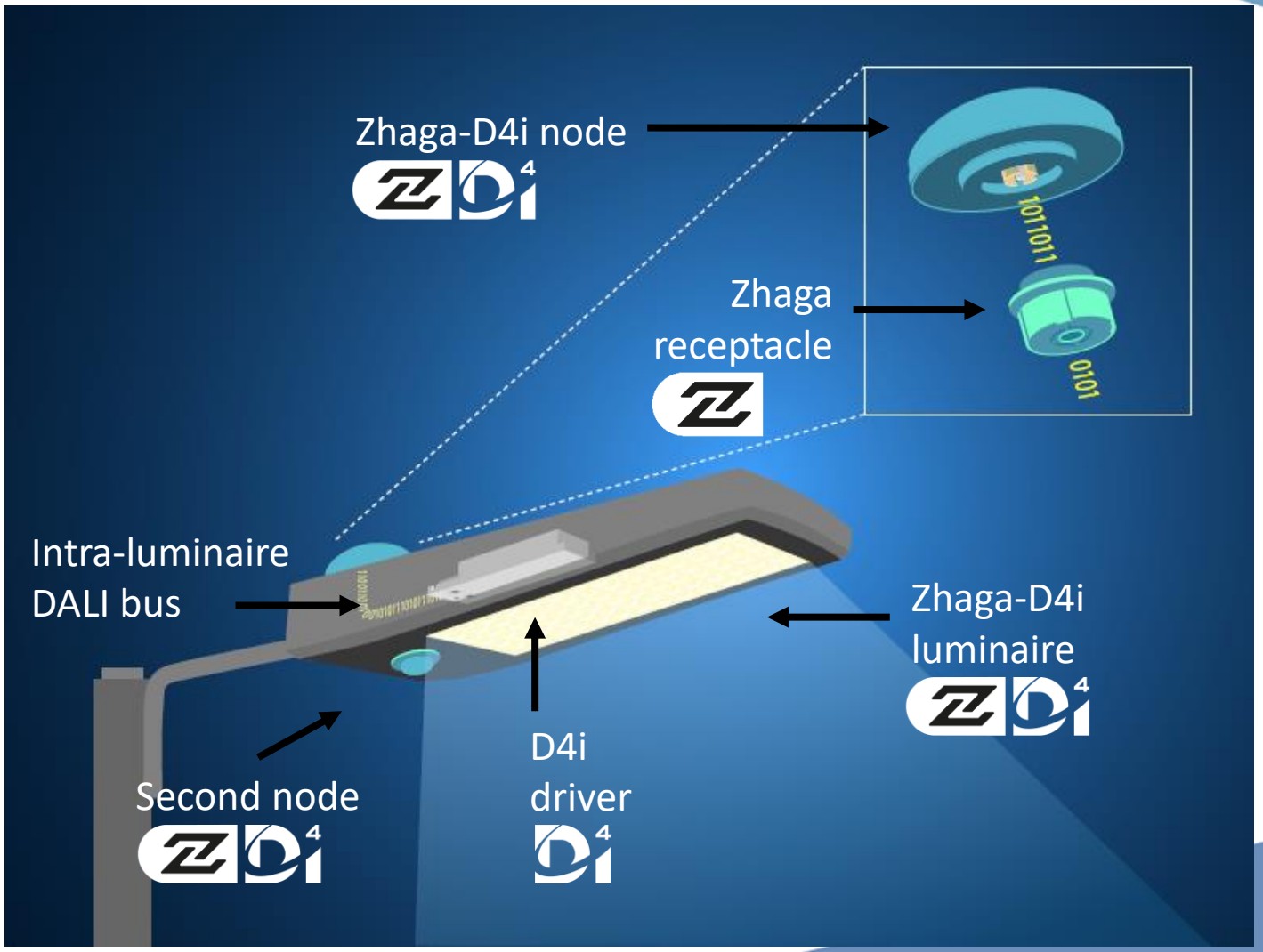
Scope of Zhaga-D4i certification



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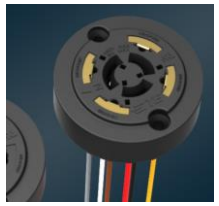
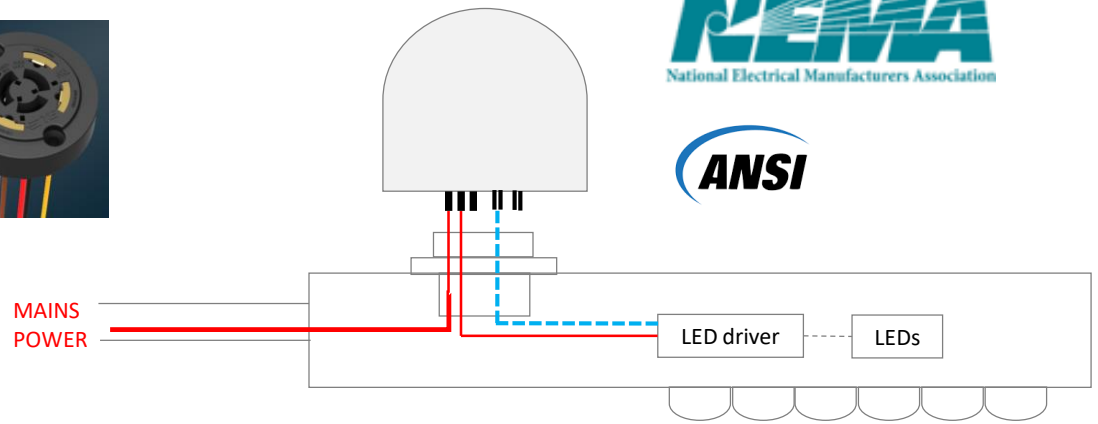
Zhaga-D4i Architecture vs NEMA Architecture



NEMA
National Electrical Manufacturers Association

ANSI



- Power goes to the Socket, that then supplies driver
- Surge Protection, Metering, Mains Switch at controller level
- Using 1-10v or DALI dimming signal Compatible with any dimmable driver
- 2 extra pins available → multiple pin out

HIGH VOLTAGE

DIMMABLE 1-10V

DALI 2

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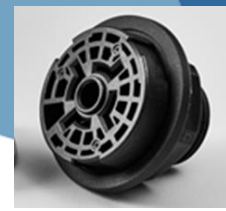

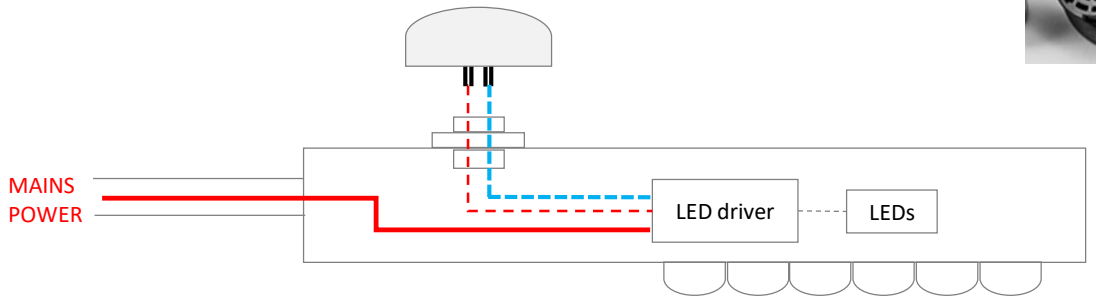

- Power goes to the driver, that then supplies controller with 24v → limited power available for peripherals (2W)
- Surge Protection & Metering at driver level
- Using DALI2 based control signal & D4i specs

LOW VOLTAGE

D4

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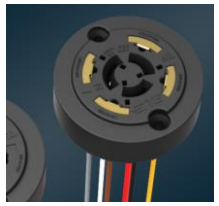
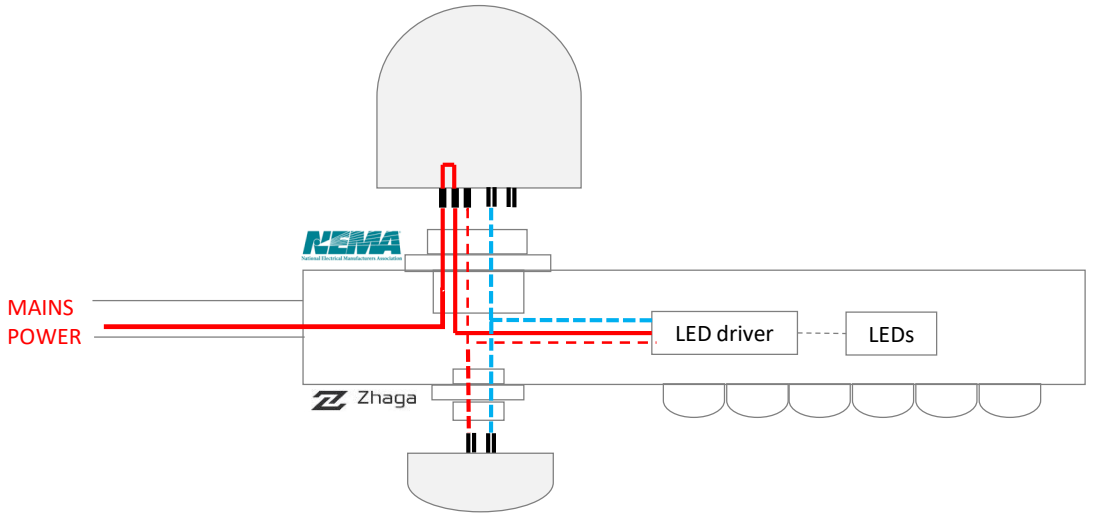
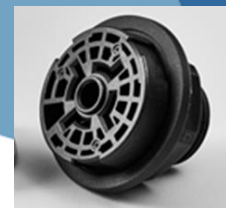
Next step – Hybrid Architecture







Zhaga Press Release – 8th October 2020 – Zhaga is planning book 18 Ed. 3

- Supporting hybrid architecture using ANSI C136.41 receptacle & Zhaga receptacle
- Specifying electrical & D4i based control interface to safeguard interoperability
- Zhaga-D4i certification program for hybrid luminaire and control devices with an ANSI interface

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Questions ?

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Thank you

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