

2023 DALI联盟中国区创新应用技术论坛

2023 DALI Alliance China Innovation Application Technology Forum

- DALI-2和D4i室内外照明控制

- DALI-2 and D4i Indoor and Outdoor Lighting Control

Scott Wade, DALI Alliance

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议程 Agenda

- DALI-2 和 D4i
- DALI-2 and D4i

- DALI 在室内外照明中的应用
- Applications for DALI in indoor and outdoor lighting

- 这些应用中使用的 DALI 功能
- DALI features used in these applications

- DALI 的未来更新
- Future updates for DALI



Scott Wade,
Technical &
Certification Manager,
DALI Alliance

DALI: The basics



Digital **A**ddressable **L**ighting **I**nterface
数字可寻址照明接口

- 全球照明控制通信标准 World-wide standard for lighting control communications
- 符合IEC 62386开放标准 Technically managed in the open standard IEC 62386
- 由 DiiA (数字照明接口联盟) 制定 Driven by Digital Illumination Interface Alliance (DiiA)
- 通过测试，认证和注册商标确保产品互操作性 Ensures interoperability through testing, certification and registration with trademark use
- 通过 DALI 通道进行控制，配置和查询设备 Control, configuration & querying of devices over a 2-wire bus
- 可对 DALI 装置进行单控，群控及广播 Individual, group & broadcast addressing to any DALI device
- DALI, DALI-2, DALI+ 和D4i商标归DiiA所有 DALI, DALI-2, DALI+ and D4i trademarks owned by DiiA



The DALI Alliance

- DALI 联盟是一个开放的全球照明公司联盟，旨在扩大基于 DALI 的照明控制解决方案市场。
- The DALI Alliance 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
- 全球拥有372个会员(至2023.8), 并持续增加中 372 members world-wide – and growing
- 会员可使用DALI商标: Membership allows DALI trademark use:
 - 多达3700个 DALI-2 认证产品 **3700+ DALI-2** certified products
 - 1600个 DALI 注册产品 **1600 DALI version-1** registered products
- 会员类型 Membership types:
 - 定期 **Regular**
 - 关联 **Associate**
 - 社区注册-灯具制造商 **Community registration** – for luminaire makers

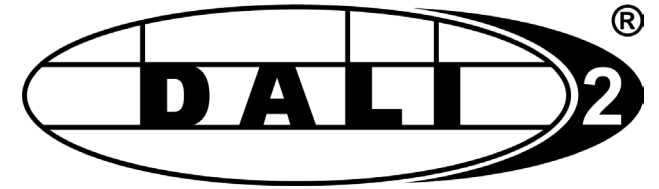


什么是 DALI-2？ What is DALI-2？

DALI-2 是一项技术和认证计划，基于国际标准 IEC 62386，以及 DALI 联盟的更改和补充。

DALI-2 is the technology and certification programme, based on international standard IEC 62386, together with changes and additions from DALI Alliance.

- 三种类型的设备：
- Three types of devices:
 - 驱动器。 示例：LED 驱动器 **Control gear. Example: LED drivers**
 - 控制装置。 示例：光传感器 **Control devices. Example: light sensors**
 - 总线电源。 为通信总线和传感器等总线供电设备提供电源。 **Bus power supplies. Provide power to the bus for communications and bus-powered devices such as sensors.**



什么是 DALI-2？ What is DALI-2？



- **认证步骤： Certification steps:**
 - 测试产品 Test the product
 - 将测试结果发送给DALI联盟进行验证。 Send test results to DALI Alliance for verification.
 - 经过验证后，产品将获得 DALI-2 认证并列在网站上。 Once verified, products are DALI-2 certified and listed on the website.
 - 然后允许使用 DALI-2 商标。 DALI-2 trademark is then permitted.

- **应用： Applications:**
 - 室内外照明系统 Indoor and outdoor lighting systems
 - 稍后会给出示例 Examples will be given later

什么是 D4i? What is D4i?

D4i 是 DALI-2 的扩展 D4i is an extension to DALI-2:

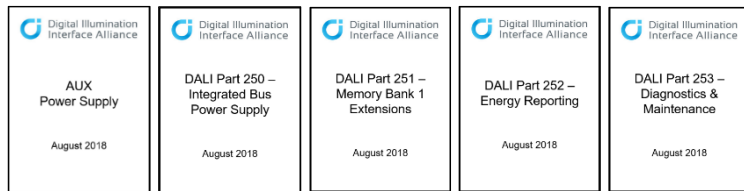
- D4i 控制装置 (驱动器) 包括 D4i control gear (drivers) include:
 - 总线供电 A bus power supply
 - 灯具、能源和诊断数据 Luminaire, energy & diagnostics data

→ 特别适合灯具内部使用 : DALI 位于灯具内部 Especially for intra-luminaire use: DALI is inside the luminaire

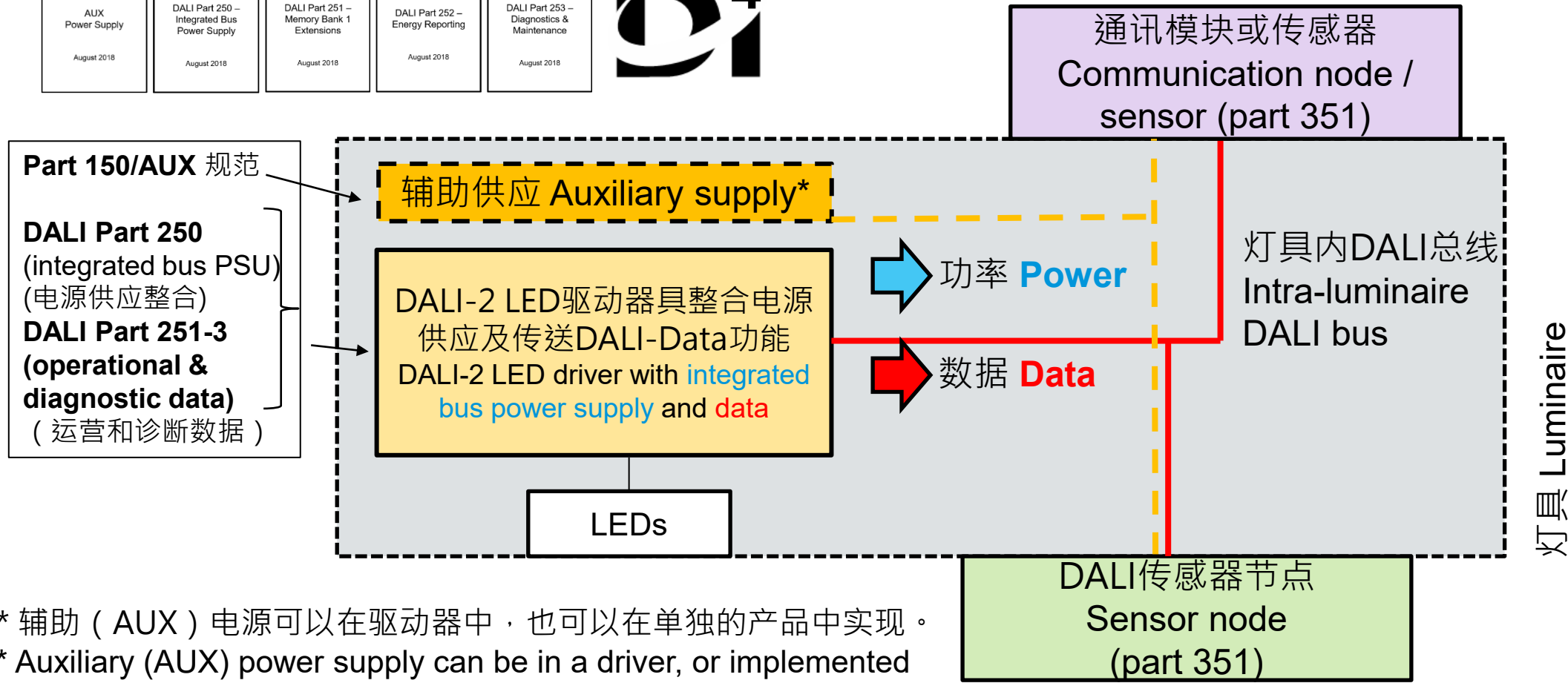
- D4i 简化了向灯具添加传感器和通信设备的过程 D4i simplifies the addition of sensors and communication devices to luminaires
- D4i 与连接器系统结合使用时可实现即插即用互操作性 D4i enables plug-and-play interoperability when combined with a connector system
 - 例如 Zhaga 第 18 册和第 20 册或 NEMA/ANSI C136.41
 - e.g. Zhaga Book 18 & 20 or NEMA/ANSI C136.41



D4i example luminaire



远程照明控制网络
Remote lighting-control network



* 辅助 (AUX) 电源可以在驱动器中，也可以在单独的产品中实现。
* Auxiliary (AUX) power supply can be in a driver, or implemented in a separate product.

Indoor and outdoor lighting applications

基于 DALI 的照明控制广泛用于室内应用，包括：

DALI-based lighting control is used in a wide range of **indoor applications**, including:

- 办公室、学校、医院、商店、银行、博物馆、工厂、住宅
Offices, schools, hospitals, shops, banks, museums, factories, residential

自 D4i 推出以来，户外应用不断增加。示例包括：

Outdoor applications have been increasing since the introduction of D4i. Examples include:

- 路灯/道路 Streetlights/roadways
- 停车区 Car parks
- 雕像/纪念碑 Statues/monuments
- 基础设施：机场、铁路、港口 Infrastructure: airports, railways, ports



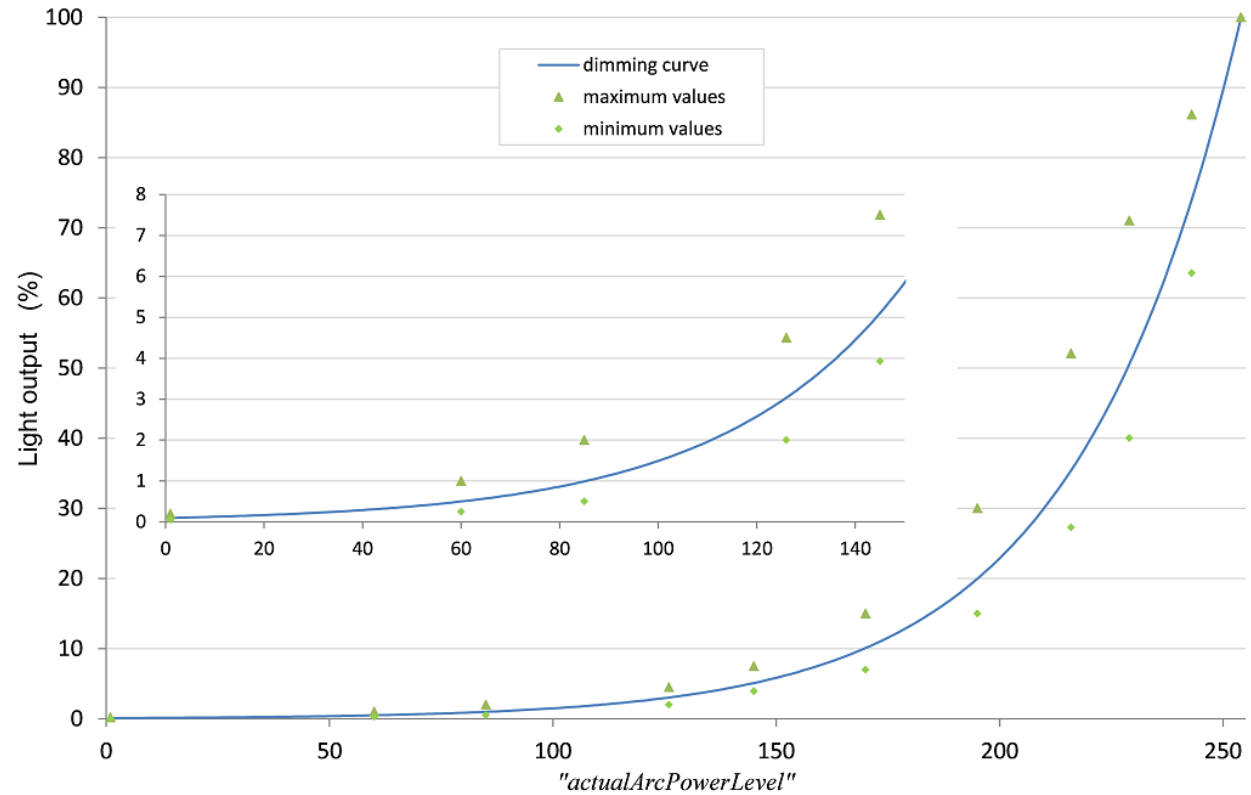
DALI features supporting indoor and outdoor lighting

	办公室、学校、 医院 Offices, schools, hospitals	商店、银行、博 物馆 Shops, banks, museums	工厂 Factories	住宅 Residential	路灯、停车场 Streetlights, car parks,	雕像、纪念碑 Statues, monuments,	机场、铁路、港 口 Airports, railways, ports
标准化调光 Standardised dimming	✓	✓	✓	✓	✓	✓	✓
应急照明 Emergency lighting	✓	✓	✓				✓
色彩控制 Colour control		✓		✓		✓	
电力和能源数据 Power and energy data	✓	✓	✓		✓		✓
灯具数据和资产 跟踪 Luminaire data and asset tracking	✓	✓	✓		✓		✓
传感器 Sensors	✓	✓	✓	✓	✓		✓



Standardised dimming

- 如果您要求50%，您将获得50%”
- “If you ask for 50%, you get 50%”
- 调光曲线已经过标准化测试
- The dimming curve is **standardised and tested**
- 这意味着设备遵循相同的调光曲线，从而保持光输出一致性
- This means that devices follow the same dimming curve, maintaining light output consistency



Emergency lighting

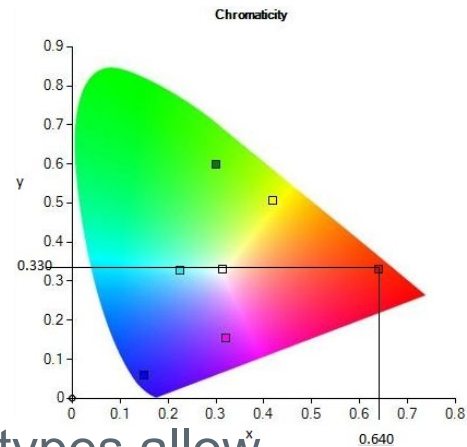
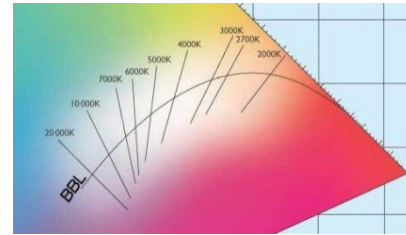


- 自动自检 Automated self-testing:
 - 在许多国家，法律要求定期测试应急照明 In many countries, there is a **legal requirement** for periodic testing of emergency lighting
 - DALI 允许实现自动化： DALI allows this to be automated:
 - **功能测试**：电池、充电电路、驱动器/继电器和灯的快速测试 **Function test**: quick test of the battery, charging circuit, driver/relay and lamp
 - **持续时间测试**：检查额定持续时间的操作（例如：1 小时、3 小时...） **Duration test**: checks operation for the rated duration (for example: 1h, 3h...)
- 反馈 Feedback:
 - 测试结果和故障信息 Test results and information on failures
 - 其他信息，包括电池充电量、灯泡工作时间等。 Other information, including battery charge level, lamp operating hours and more.



Colour control

- 允许简单的颜色控制 Allows simple control of colour:
 - **RGBWAF** 用于单独控制每个颜色通道 **RGBWAF** for individual control of each colour channel
 - 用于色温控制的 Tc/可调白色 **Tc/tuneable white** for colour temperature control
- 允许精确和可重复的颜色选择 Allows precise and repeatable selection of colour:
 - **xy 色度 xy chromaticity**
- 允许在颜色之间平滑褪色 Allows smooth fading between colours
- 为了获得最佳效果，xy 和 Tc 颜色类型允许校准 For best results, xy and Tc colour types allow calibration



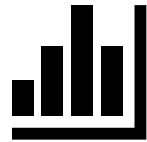
Data specifications



Luminaire Data



Energy Data



Diagnostics Data



- DiiA part 251 – 存储条1 扩展(灯具数据) Memory Bank 1 Extension (Luminaire Data)
 - 包括灯具电源 + 电压、光输出、CCT + CRI、光分布、灯具颜色和其他灯具数据。
 - Includes luminaire supply power & voltage, light output, CCT & CRI, light distribution, luminaire colour and other luminaire data.
- DiiA part 252 – 能源报告 Energy Reporting
 - 有源能量/功率、表观能量/功率、负载侧能量/功率
 - Active energy/power, apparent energy/power, load-side energy/power
- DiiA part 253 – 诊断与维护 Diagnostics and Maintenance
 - 控制齿轮和灯（包括计数器）的故障条件。工作时间、启动计数器、电源电压/频率/功率因数和输出电流。光源电压/电流/温度、启动计数器和准时。
 - Failure conditions for control gear and lamps, including counters. Operating time, start counter, supply voltage/frequency/power-factor and output current. Light-source voltage/current/temperature, start-counter and on-time.

• 这些规范可从 DiiA 获得，并且也包含在 ANSI C137.4 中。

• **These specifications are available from DiiA, and are also included in ANSI C137.4.**

Sensors and input devices

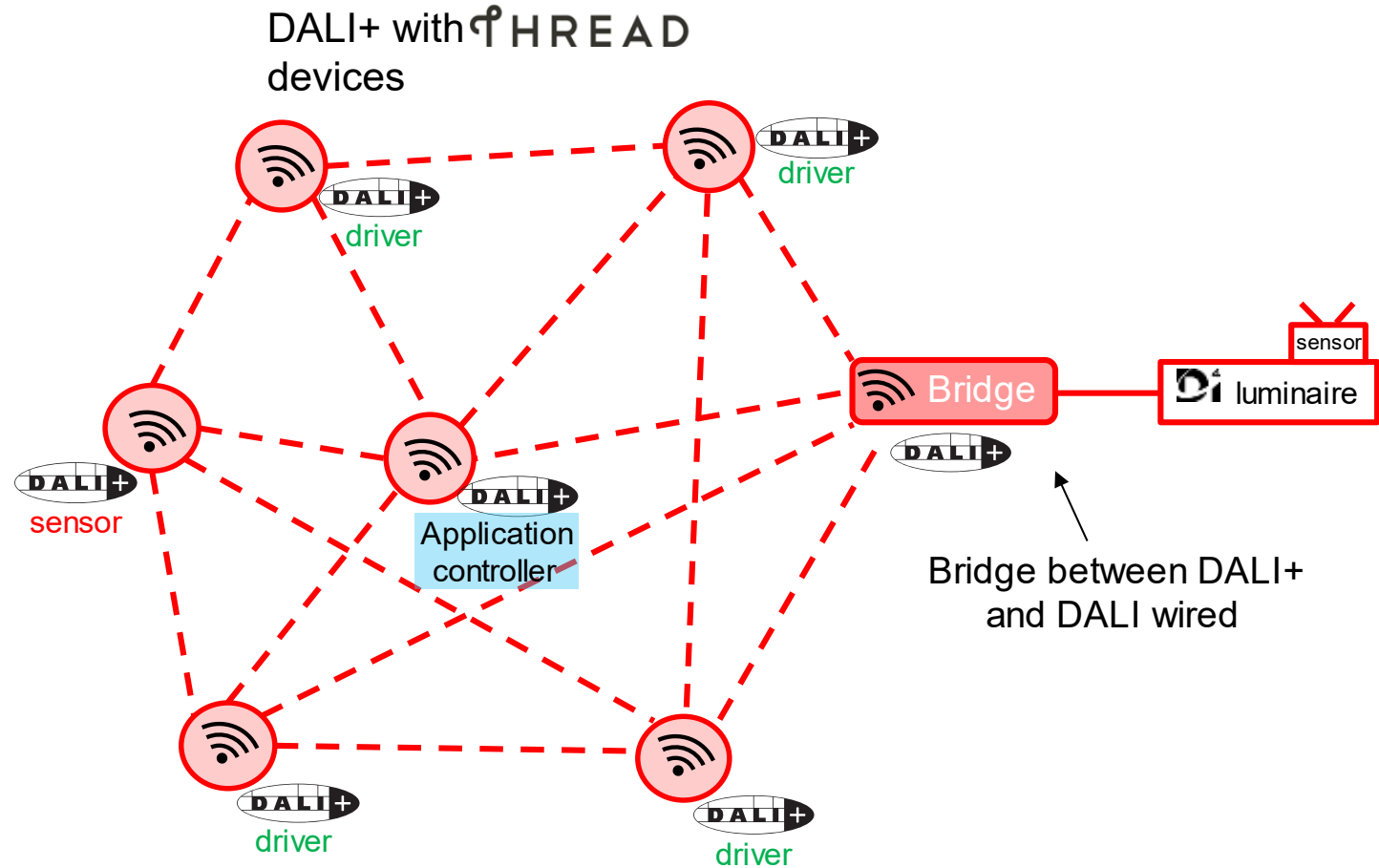
- 目前有四种类型 Currently four types:
 - 301 按钮 Push-buttons
 - 302 绝对输入设备 (开关、滑块) Absolute input devices (switches, sliders)
 - 303 占用传感器 Occupancy sensors
 - 304 光传感器 Light sensors

- IEC 即将发布两个新部分 Two new parts are nearing publication by IEC:
 - Part 305: 颜色传感器 Colour sensor
 - Part 306: 通用传感器 General purpose sensor



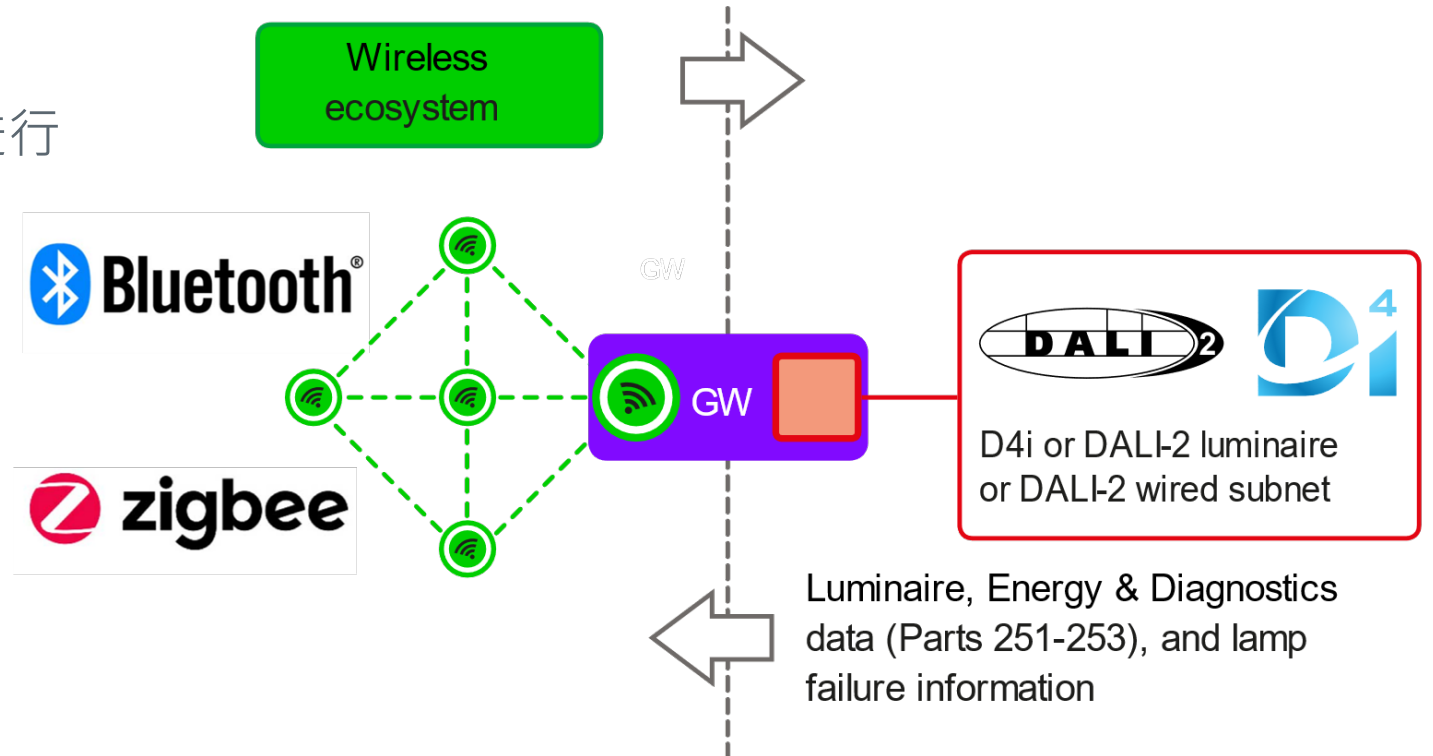
Coming soon: DALI+ with Thread

- 第 104 部分, DALI+ with Thread
- Part 104, DALI+ with Thread
- Thread 网络承载包含 DALI 命令的帧。
- Thread network carries frames containing DALI commands.
- 第一个版本将包括以下部分：
- First release will include parts:
 - 102, 207, 301-304.
 - 连接 DALI 有线灯具或网络。 Bridge to DALI wired luminaires or networks.
- Thread 网络可以包括边界路由器，允许网络流量通过以太网或 Wi-Fi 路由，包括路由到其他 Thread 网络。
- Thread networks can include **border routers**, allowing the network traffic to be routed through Ethernet or Wi-Fi, including to other Thread networks.



Coming soon: Gateways

- 第 341 部分和第 342 部分网关
- Part 341 and 342 gateways
- 对一个或多个 DALI-2 或 D4i 灯具进行“广播”控制。
- “Broadcast” control of one or more DALI-2 or D4i luminaires.
- 数据传输至蓝牙/Zigbee 生态系统：
- Data is transferred to the Bluetooth/Zigbee ecosystem:
 - 灯具数据 Luminaire data
 - 功率/能源数据 Power/energy data
 - 诊断数据 Diagnostics data



DALI快速入门指南下载 ***DALI Quick Start Guide:***

<http://www.dali2.org/downloads/>



Email: info@DALI-Alliance.org

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