

DALI-2: New Standards and Mandatory Certification

International Trends in Lighting – Forum & Show



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DiiA and DALI

- Digital Illumination Interface Alliance
 - An open, global consortium of lighting companies that promotes the adoption of lighting-control systems using DALI technology
 - 76 members (August 2017)
 - Provides the DALI trademarks to members
 - Creates and maintains the official DALI test sequences for members
 - Provides a DALI-2 Certification process and DALI version-1 registration
- Certification or Registration?
 - Certification: DALI-2
 - More details later...
 - Registration: DALI version-1



IEC 62386

- What's new?
 - Input devices (multi-masters)
- What's next?
 - 332 Feedback and 333 Manual configuration (control device features)
 - 2xx parts: Power measurement, thermal information, central emergency, load shedding, ...
 - Amendments for parts 101, 102 and 103
 - Other drafts in progress:
 - 104 DALI – Wireless and alternative wired systems (wireless, power-line, internet protocol...)
 - 105 Firmware update



IEC 62386

IEC 62386

101 – General requirements – System (V1 & V2)

104 – General requirements – Wireless and alternative wired system (in progress)

105 – General requirements – Firmware update (in progress)

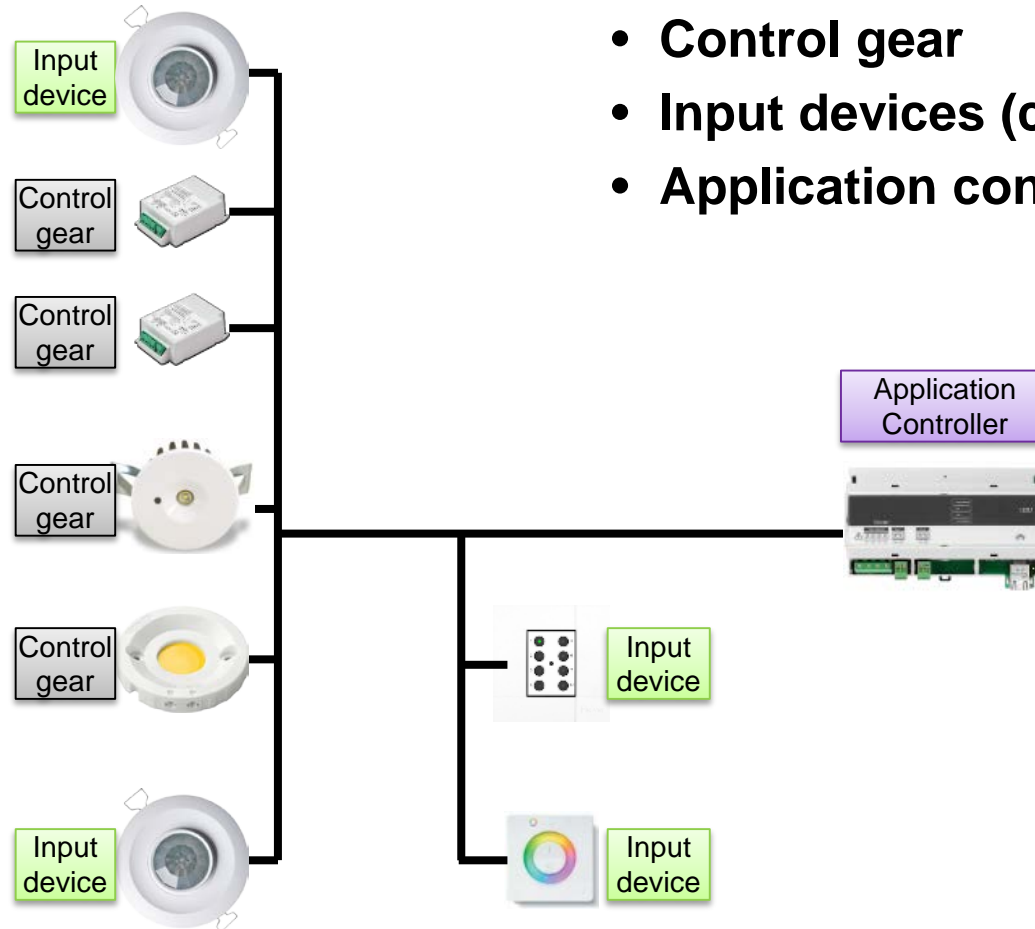
102 – Control gear (V1 & V2)

103 – Control devices (V2)



			in progress (control gear functions):			Input devices:		
207 LED (V2 in progress)	208 Switching	209 Colour Control	225 Colour Tc	226 Colour xy	224 Integrated Light source	307 Relative input devices (in progress)	332 Feedback (in progress)	333 Manual configuration (in progress)
204 LV Halogen	205 Incandescent Dimmer	206 Conversion to DC (0/1-10 V)	219 Power measurement	220 Central emergency	221 Load shedding	304 Light sensor	305 Colour sensor (future part)	
201 Fluorescent (V1 & V2)	202 Self-contained Emergency (V2 in progress)	203 HID	216 Load referencing	217 Thermal gear information	218 Dimming curve selection	301 Push Buttons	302 Absolute input devices	303 Occupancy Sensors

System example



- Control gear
- Input devices (control devices)
- Application controller (control devices)

Note:

- Systems can contain more than one application controller.
- A bus power supply is required, either separate or integrated with an existing device.

Control devices

Two types of control device:

- **Application controllers**

- The “brains” of the system.
- Use information from any source, make decisions and can send commands to the control gear



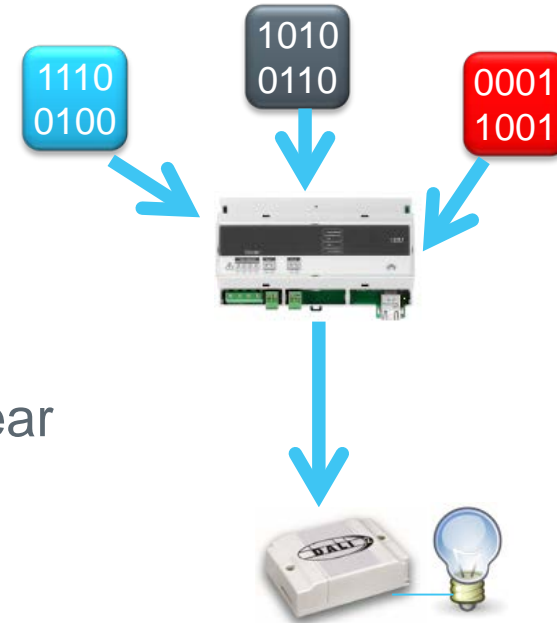
- **Input devices**

- Fairly simple devices that provide information to the system
- Examples include push-buttons, sliders, occupancy sensors, and light sensors



Control devices: Application controllers

- Can use information from any source, including:
 - Control gear
 - Input devices
 - Other application controllers
 - External devices/buses/systems
- Can make decisions, and can send commands to control gear
 - No other device can send commands to control gear
- Single-master or multi-master allowed
 - **Single-master:** simpler – a receiver is not necessary, but can optionally be used to allow polling of input devices, or checking status of control gear
 - **Multi-master:** supports event driven operation of input devices



Application controller examples

1. Ceiling-mounted occupancy sensor, broadcasting levels to the control gear
 - This could be a **single-master** application controller
 - **Only one** is allowed in a DALI system

2. DIN-rail mounted controller driving two DALI buses
 - This could be a **multi-master** application controller
 - Other multi-masters can be used on each bus



Control devices: Input devices

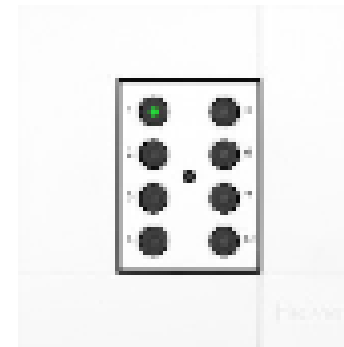


- Provide information to application controllers
- Multi-master
- Can be polled, but normally used in event driven mode
- Four input devices already published in IEC 62386
 - 301 Push buttons
 - 302 Absolute input devices
 - 303 Occupancy sensor
 - 304 Light sensor

Input device examples

Push-button with LED feedback

- 101, 103 Control devices
- 301 push-button (x8 instances)
- 332 feedback (x8 features at instance level)
- Events include:
 - Press/release
 - Short press, long press, double press
 - Button stuck
- Feedback allows control of:
 - brightness/colour/volume/pitch
 - One per instance (button) and/or per device



Input device examples

Combined occupancy and light sensor

- 101, 103 Control device
- 303 occupancy sensor (x1 instance)
- 304 light sensor (x1 instance)

- Events include:
 - Occupied/vacant, movement
 - Illuminance level (after a change)
 - A **report timer** allows periodic reporting of the input value
- Polling can also be used



Benefits of



- **Control devices** – part 103
 - **ONLY** certified control devices can use the DALI-2 trademark
 - *Application controllers* and *Input devices* defined
 - Single-masters and multi-masters allowed
 - *Event priorities* defined
 - Separate addressing & grouping from control gear



Benefits of



Control gear and bus power supplies – improvements:

Property	Benefit
Clearer specification, including bus timing and bus power supplies	Improved interoperability
Requirement for polarity insensitivity	Easier installation
Bus powered units	Less wiring
Multiple logical units	More cost-effective products
Extended fade time, 100 ms to 16 minutes	Increased comfort and flexibility
Manufacturer specific operating modes	Improved interoperability and flexibility
Query light source type	Easier maintenance

DALI-2 certification

- Products

- Control gear

- Parts 101, 102 and/or 207

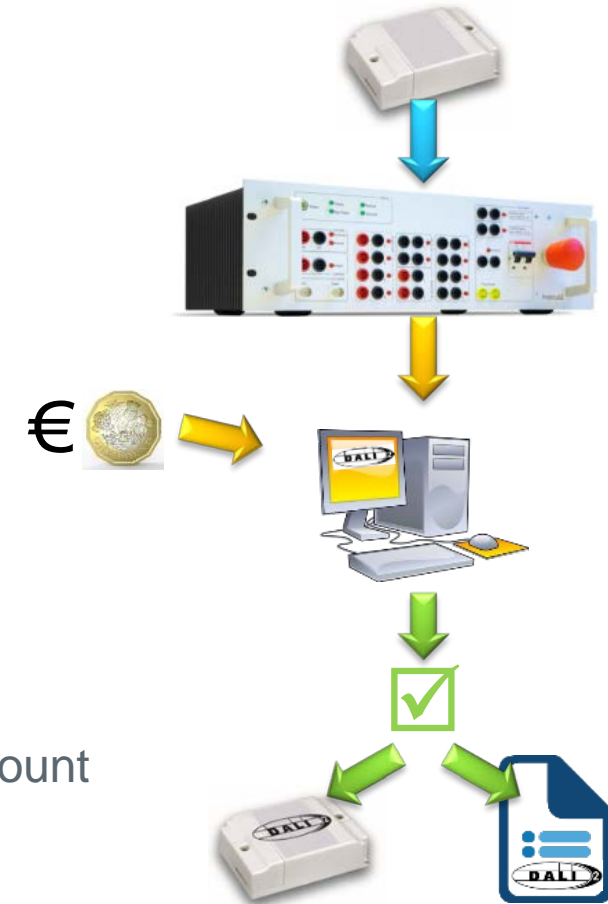
- Control devices

- Parts 101 & 103 (Single-master application controllers)



- How to certify

- Test using the latest version of the official test sequences
- Submit product information and test results through member's account
- Independent verification of results by DiiA
- Success! → certification is granted



DALI-2 Certification

- How to check:
 - The DALI-2 trademark is only allowed once a product has successfully completed certification.
 - Check the product label.
 - Check the web-site. Every DALI-2 certified product is shown in a public area of the web-site:
 - www.digitalilluminationinterface.org/products
- Next products for certification
 - Multi-master application controllers
 - Bus power supplies
 - Colour control (xy and Tc)
 - Input devices
 - Self-contained emergency
- Plugfest
 - Members bring their products for testing with control gear or control devices from other members
 - Live testing with a variety of products
 - Results in improved interoperability
 - Next: October, Dornbirn



Summary

- The main aims of the Digital Illumination Interface Alliance were explained.
- New parts of IEC 62386 were shown, as well as the upcoming parts.
- Example input devices (push-button and sensor) were explained.
- Interoperability of DALI products is achieved through a certification programme for DALI-2.

