DALI - An Introduction

In the 1980s there was a strong requirement to make commercial lighting more controllable so that it could become more energy efficient.

Initially this was done with analogue control, allowing fluorescent ballasts to be controlled from a central source. This was a step in the right direction, but cabling was complicated and therefore not cost effective.

In the late 1990s a controls group, DALI-ag, was set up to design an industry-wide open digital protocol for the commercial lighting market.

The requirements were:

1. Low cost, simple wiring
2. Individual Control
3. Feedback from the fixtures
4. Ability to add sensors and other proprietary equipment

DALI was released in 2001 and became widely adopted. Since then, its popularity has increased and it is now used in more than just commercial lighting - so much so that it is becoming commonplace to have DMX and DALI systems integrated for centralised control.

Visit www.DALI-ag.org for more details regarding the DALI working group.

Why DALI?

DALI was created to provide central control over fixtures, enabling commercial lighting to become more efficient. While the initial development focused on fluorescent ballasts, applications now encompass a range of devices such as LED drivers, HID and low-voltage halogen. In the future, the scope will include rotaries, light sensors and more.

DALI stands for Digital Addressable Lighting Interface. It is technically managed under IEC 62386.

Overview of a DALI System

There are four main components required for a DALI subnet (a subnet or circuit is the DALI equivalent of a DMX universe).

1. A DALI controller (may be a gateway, hub or router)
2. A DALI Bus Power Supply
3. Some kind of DALI device
4. Cabling

The system in Figure 1 can be considered one subnet of DALI.

- A DALI subnet can have up to 64 DALI devices/ballasts
- A DALI Bus PSU must always be present on each DALI subnet
- Each device has a short address (0 to 63)
- There should be no duplicate short addresses
- Each device can be assigned to any of the 16 groups
- Each device can have 16 scenes programmed into its memory

Typical Applications

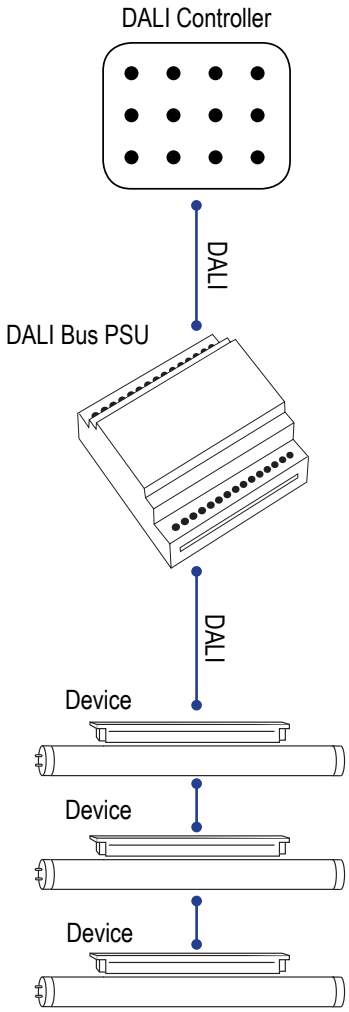
DALI can be used in any environment that requires central control over lighting fixtures. The most common applications are:

- Commercial office lighting
- House lighting in theatres
- Public building lighting (such as hospitals, airports etc.)

There are a number of limitations to DALI that restrict its applications:

- Slow speed
- Relatively low number of devices on a subnet
- Type of DALI equipment on the market

Figure 1: Basic DALI System



Glossary of Terms

Ballast	Technically, a driver for a light source that communciates using DALI. Often taken to mean the light source itself. Used interchangeably with Device.
Bus	The wire that data travels down.
Circuit	A single DALI line - see Subnet.
Commissioning	The phase that sets up DALI devices for the first time to enable them to be used in a DALI subnet.
DALI	Digital Addressable Lighting Interface
DALI Bus PSU	A PSU that must be present for DALI communication. These are often separate to the controller. Ideally they should be centrally located on a DALI bus.
Device	DALI equipment - usually a light or a sensor. It will require one short address. See also Ballast.
DMX512	Lighting Protocol used in Entertainment style applications.
DSI	Digital Signal Interface
Gateway	A device that allows data transmission between different systems (see also Hub and Router).
Group	A collection of devices that can respond to the same command
Hub	A device that allows data transmission between different systems (see also Gateway and Router).
Router	A device that allows data transmission between different systems (see also Gateway and Hub).
Scene	A level held in device memory that can be recalled with a ‘Scene’ command
Short Address	The indentification number of a DALI device - must be unique on the network and between 0 and 63
Subnet	Synonymous with Circuit. It comprises the DALI controller, a DALI Bus PSU and the device(s).