



X A V I O D E S I G N

M A Y F A I R

DALI Dimming Protocol

What is DALI dimming?

When should DALI dimming be used for high-end residential projects?

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DALI Dimming Protocol

What is DALI dimming, and when should it be used for high-end residential projects?

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SECTION 1 – Overview of different types of dimming & switching.

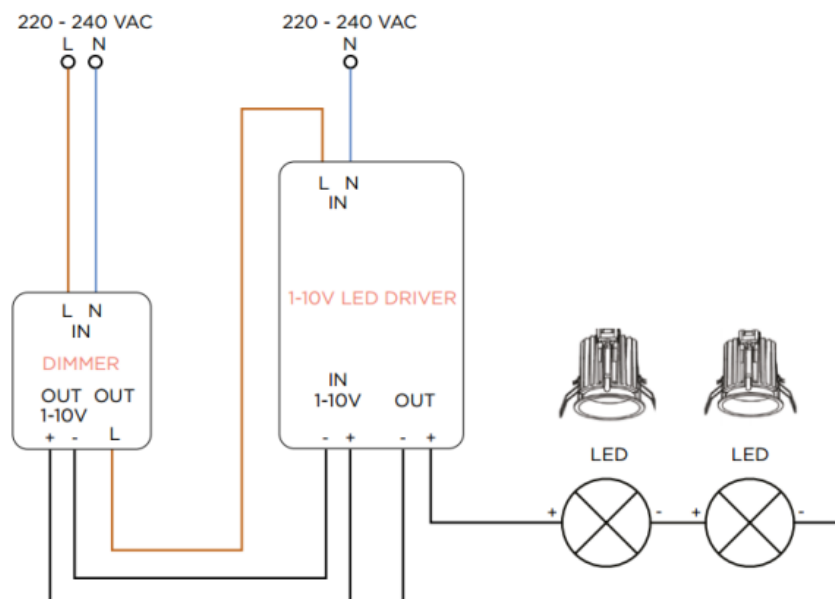
1.1 | Phase dimming

- Mains voltage dimming. (A controller changes the shape of the electrical sine wave to control dimming through the twin & earth 240V cable.)
- No extra control cable required.
- Used typically in high end residential for chandeliers, decorative wall lights, table lamps and floor lamps.
- If phase dimming is used with LED downlights, the result is often less successful than using 0-10V or DALI.
- Rarely possible to achieve successful performance with LED linear strips.
- Rarely possible with recessed LED floor uplighters, LED stairlights, and other LED accent lights.
- Limited dimming range.
- When used with LED phase dimming lamps (i.e. LED candle lamps for chandeliers) the dimming levels often cannot go below 30%.
- Numbers of LED luminaires need to be carefully checked against the dimmer specifications. Phase dimming of LED is rarely straightforward, and often highly problematic. **Lutron systems** in particular have different levels of wattage output, and circuits must often be divided to ensure compatibility.

1.2 | Dimming via 0-10V / 1-10V

- 2-core control cable required.
- Drivers cannot be individually addressed, and must be hard-wired in their final lighting control groups.
- Gives simple and reliable control of LED downlights, LED accent lights, and LED linear systems (i.e. ceiling coffers, joinery lighting.)
- Good dimming range.
- This method usually **cannot** be used for chandeliers, pendants, decorative wall lights, table lamps or floor lamps.

WHAT IS 1-10V DIMMING?



1.3 | DALI dimming

- 2-core control cable required.
- Lighting circuits can be re-configured digitally (within certain parameters) after installation is completed.
- Typically used to give very fine and flexible control of LED downlights, LED accent lights, and LED linear systems (i.e. ceiling coffers, joinery lighting.)
- Very wide dimming range.
- This method often **cannot** be used for chandeliers, pendants, decorative wall lights, table lamps or floor lamps. (unless a specialist interface is used, and some manufacturers are starting to give this as an option, as they recognise the advantages of DALI.)
- The latest versions of DALI (DT-8, for example) can also provide control of RGBW/Tunable White luminaires, which previous versions could not. This is still only capable of simple colour change applications, and DMX should be used for any complex requirements.

1.4 | DMX

- Requires a specialist control cable and interface.
- Highly addressable and controllable via user interfaces that can be very complex if required.
- Commonly used mainly for the control of colour programmable RGB or RGBW LED luminaires, for example underwater swimming pool lighting, colour changing coffer lighting in a games room or home cinema, disco rooms, or other mood systems.
- Generally only used with professionally designed systems and for specialist applications.

1.5 | Switch / Non-dim

- No control cable required.
- No brightness control or addressing is possible.
- In high end residential projects, this is sometimes used for 5A circuits where it is not known if the table/floor lamps will be dimmable. Also used for lightsources that are very low in output and will never need to be dimmed.

SECTION 2 – What is DALI dimming?

2.1 | Introduction to DALI

In any dimming system, the ballasts and controllers must be able to speak and hear the same language. In the case of digital dimming systems, this language is either **proprietary** – that is, unique to a particular manufacturer and, if allowed, other adopters – or an **open standard**; such as DALI protocol.

DALI stands for Digital Addressable Lighting Interface.

It is a non-proprietary interface standard for dimmable electronic control gear, offering huge flexibility and a range of additional benefits.

A 2-wire control line manages a group of DALI ballasts (drivers) either individually or in a broadcast scenario. Switching and dimming are handled via the control line with no need for a relay.

DALI is royalty-free, two-way, open, non-proprietary and interoperable digital protocol and a standard in the United States and Europe. (Original European Standard 60929, NEMA 243-2004.)

This protocol has now been internationally standardised through the International Electrotechnical Commission (IEC). The full DALI protocol is set out in the technical standard IEC 62386.

2.2 | Advantages of DALI

1. Circuit 'groups' can be assigned digitally after installation. No need to decide at design stage as to which luminaires will be grouped together.
2. No relays are needed for switching the fixtures. (Switching & dimming are handled exclusively via the control line.)
3. Synchronised changes from one lighting scene to another. Even if different luminaires are started at different dimming values or different types of lamps are combined with each other, DALI changes from one lighting scene to another in synchronism. All the light sources reach the new light value at the same time.
4. Flexible for a later change of use. With DALI, the lighting groups are not hard-wired. The individual fixtures are grouped by simply assigning them to groups with the aid of a controller. These groupings can be changed at any time.
5. Provides true interchangeability across drivers and controls. By specifying DALI as an open platform, multiple manufacturers can be involved in a system, instead of being tied to a single supplier. This can result in more flexibility of choice, potentially lower costs, ensures future availability, and enables the system designer to select the best products from various manufacturers and combine them to achieve desired results.
6. DALI provides standardised ballast performance. It ensures consistent dimming performance across all dimming drivers regardless of type or manufacturer, more reliably than with other dimming types.
7. Simplified wiring. Daisy-chain and spurs are allowed. The digital protocol allows robust communication even with low-cost cable, and with most devices being polarity insensitive, mistakes in wiring are reduced.
8. A single pair of control wires, which form the bus, connect the ballasts and controls directly, which simplifies wiring in spaces with multiple control zones by reducing the number of home-runs.
9. The level of skilled labour is reduced because there is no need to pull cables according to a zoning schedule. Each ballast on the circuit is wired in the same way.
10. Standard 2-core cable can be used. (1.5mm²)
11. Free wiring topology.
12. DALI low voltage power and data on same pair of wires.
13. DALI uses a system of distributed intelligence: multiple controllers communicate with intelligent drivers. Each controller operates as a 'master' and controls communication on the control line. Drivers react only as 'slaves' at the request of the 'master'. Certain parameters are stored directly in the DALI unit. (e.g. scene values, group addresses.)
14. Interference of data transmission is large ruled out for DALI thanks to a generously designed interference voltage distance as well as the wide ranges for digital 'low' and 'high'. This means that shielded control lines are not required.
15. DALI uses floating control input. This means that the control input is galvanically separated from the mains voltage (basic insulation, however no extra-low voltage SELV.) Thus, the DALI drivers may be operated on different external cables (phases.)

2.3 | Parameters of DALI

1. A maximum of 64 DALI devices on one 'loop' or subnet.
2. A maximum of 16 groups per DALI 'loop' or subnet. (Or Zones)
3. A maximum of 16 memory scenes per DALI unit.
4. The standard states that the DALI protocol is designed to sit below the level of a building management system.
5. Max 300 metres of DALI cabling (with a line cross-section of 1.5mm²)
6. Max 240mA device consumption.
7. A voltage drop of 2V must not be exceeded.

2.4 | Calculating the voltage drop on a DALI loop

The formula for calculating the voltage drop is as follows:

$U_V = \frac{2 \cdot l \cdot I}{\gamma \cdot S}$	U_V	Voltage drop in V
	I	Current in A (0.25 A)
	S	Cross section in mm ²
	l	Cable length in m
	γ	Electrical conductivity in m / (Ω mm ²), for copper cable: 56 m / (Ω mm ²)

Example: DALI circuit with a cable length of 300 metres and a cable cross-section of 1.5mm²:

$$U_V = \frac{2 \cdot l \cdot I}{\gamma \cdot S} = \frac{2 \cdot 300m \cdot 0.25A}{56 \cdot 1.5mm^2} = 1,786V$$

This example shows that:

- For a cable length of 300m the voltage drop along the cable is 1.786V.
- A further voltage drop of 0.214V is available for terminal points (contact resistance.)

2.5 | DALI Cable

Typical composition of a DALI cable:



1. DALI systems require 2 cables for the DALI control circuit.
2. The mains line voltage and the bus (communication) line may be routed in the same cable. This means a 5-core cable (L,N,PE,DA,DA).
3. The DALI signal is not SELV. The installation instructions for low voltage cabling therefore apply.)
4. There is no need to observe polarity with the DALI pair.

According to DIN VDE 0100/T520/Part 6, main circuits and associated auxiliary circuits may be laid together even if the auxiliary circuits carry a lower voltage than the main circuits. Installers must ensure that they use cable designed to take the maximum operating voltage.

2.6 | Addressing DALI drivers

One of the benefits of DALI is the flexibility in the way that devices may be addressed.

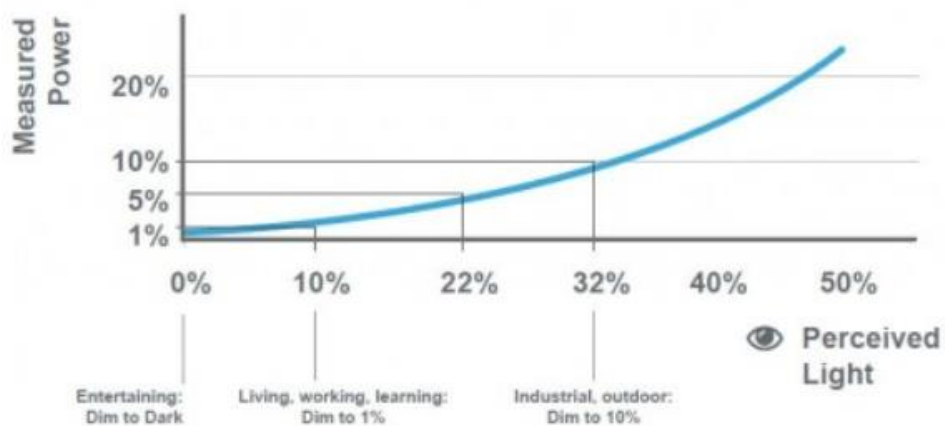
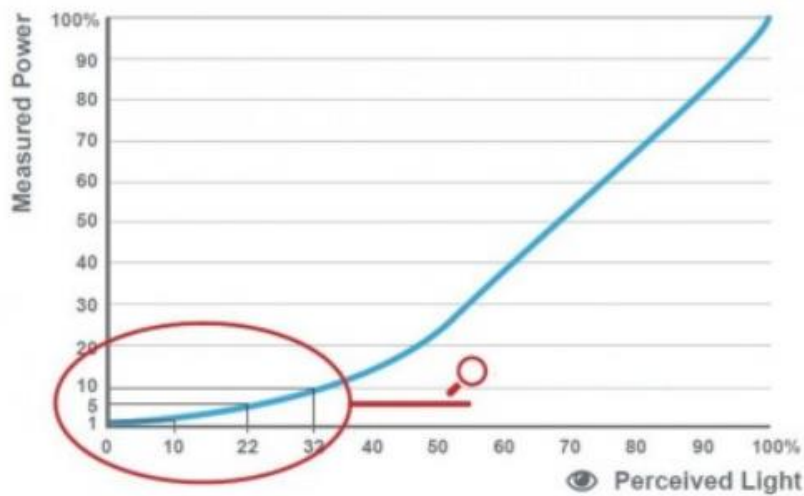
1. **BROADCAST.** At the simplest level, all devices are addressed simultaneously by broadcast commands. This can allow control of lighting in a similar manner to 1-10V analogue control, without requiring any configuration of the individual devices. If a level (Direct Arc Power Command) is broadcast, then all control gear will act upon that command, changing their output to the same new level.
2. **INDIVIDUALLY ADDRESSED.** With simple configuration, DALI devices can be given one of 64 short addresses. This allows individual control, configuration and querying of any single device in the system.
3. **GROUP ADDRESSED.** Devices can also be addressed as a group. For example a DALI LED driver could be programmed to be in any combination of the 16 available groups. When a command is sent to a group, only devices that are in that group will be addressed.

2.7 | Dim to Dark

Using high quality LED drivers, such as EldoLED, DALI has the power and range to give very effective dimming down to 0.1%. This is a huge advantage over less sophisticated LED dimming techniques such as phase dimming.

Why is this so important? As EldoLED studies show, the human eye's sensity is very non-linear.

This means that an LED driver that only dims down to 10% is perceived by the human eye as being at 32% brightness level. This shows how crucial it is for an LED driver to be able to dim as low as 1% or below. (Even a driver at 1% brightness is perceived by the human eye as being at 10% brightness.)



Diagrams courtesy of EldoLED.

2.8 | Logarithmic dimming curve

DALI digital systems typically use logarithmic dimming (as opposed to linear dimming.) The dimming curve is matched to the sensitivity of the eye. This means that the curve of the dimming is very smooth and avoids visible dimming steps in the region of low luminance levels.

The IEC 62386 defines the dimming range of a DALI control gear from 0.1% to 100%. The dimming curve is shown in the following graph. To the eye, this gradation corresponds to the linear behaviour according to the Weber-Fechner Law, which states that the subjective strength of sensations behaves logarithmically relative to the objective intensity of the physical stimulus.

The dependence of the relative luminous flux $X(n)$ on the digital 8-bit value n is described through the following correlation:

$$X(n) = 10^{\frac{n-1}{253/3}} \rightarrow \left| \frac{X(n) - X(n+1)}{X(n)} \right| = 2,8\% = \text{Const.}$$

DALI dimming curve

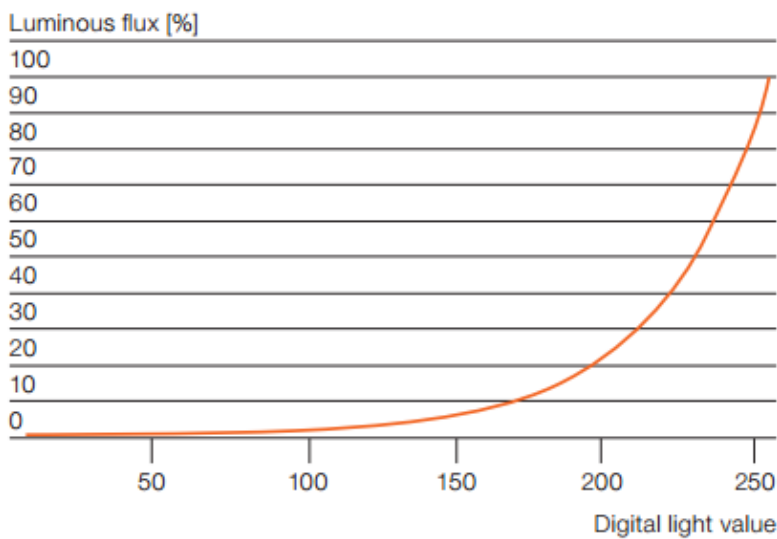


Diagram courtesy of Osram.

2.9 | DALI Cost Implications

DALI drivers and controls typically present a higher component cost than 0-10V, phase or non-dimming systems, but they can conversely present a lower installation cost due to a reduction in cable lengths and labour time.

DALI systems (specifically individually addressed drivers) require a more sophisticated programming process when centralised systems are used, which can increase the commissioning costs and extra time must be allowed for programming.

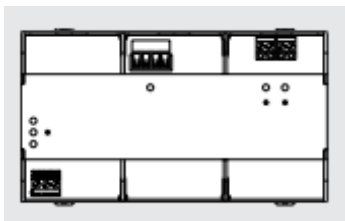
2.10 | Networked Lighting Control Systems

DALI dimming uses less rack space per circuit on a typical lighting control system (such as a Lutron QS Homeworks) than any other type of dimming protocol.

This is an advantage in projects with limited space for Lutron panels. (For example, if panels are being concealed in joinery on each floor level where space may be at a premium.)

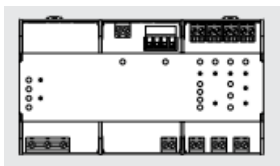
Typical Lutron modules and the number of lighting circuits they can control:

Lutron **Phase** dimming module:
(216mm wide)



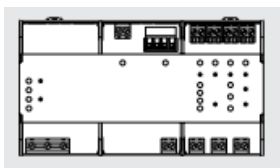
= **4 circuits** (groups) of phase dimming luminaires.

Lutron **Switching** module:
(162mm wide)



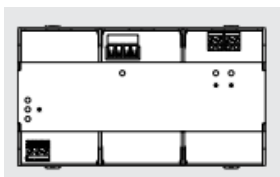
= **4 circuits** (groups) of non-dimming luminaires.

Lutron **0-10V** dimming module:
(162mm wide)



= **4 circuits** (groups) of 0-10V dimming LED luminaires.

Lutron **DALI** dimming module:
(162mm wide)



= **32 groups** of DALI dimming LED luminaires. (Max 128 DALI drivers)

(2 x DALI loops of 16 groups per loop, and a max 64 luminaires per loop.)

2.11 | DALI and 1-10V LED Dimming in comparison

DALI	1-10V
Two-wire line (polarity-free)	Two-wire line (with polarity +/-)
Addressing possible: <ul style="list-style-type: none"> - Individually (max 64 addresses) - In groups (max 16 groups) - All together Wiring in groups is not necessary.	Addressing is not possible. <ul style="list-style-type: none"> - Hard wiring in groups is necessary.
Faster installation.	Slower installation.
Scene memory in drivers (max 16 scenes)	Not possible.
Individual addressing of the DALI ECG (Electronic Control Gear)	Not possible.
Status messages from the DALI control gear: <ul style="list-style-type: none"> - Lamp malfunctions - Operating duration - Dimmer setting 	Not possible.
2-way communication	Unidirectional communication (1-way) only.
Individual dimming options <ul style="list-style-type: none"> - Saving the last dimming value as the starting value. 	Not possible.
Switching is controlled by the electronic interface.	External mains voltage change-over switch is required. (i.e. a relay).
Equipment can be more costly to purchase.	Equipment is often less costly to purchase.
Extra commissioning time is required if DALI units are individually addressed.	Very quick & simple for commissioning.
Less rack space required per circuit on a typical networked lighting control system. (e.g. Lutron QS Homeworks.)	More rack space required per circuit on a typical networked lighting control system. (e.g. Lutron QS Homeworks.)
Lighting groups can be digitally altered after installation & commissioning.	Lighting groups cannot be altered after installation without major re-wiring.

SECTION 3 – Using DALI in High End Residential Projects

3.1 | Project Case Studies & Dimming Type Recommendations

- **It is assumed that all of these projects have a networked lighting control system such as Lutron Homeworks QS.**
- **Please note that a lighting consultant should always be referred to on a project-by-project basis when making these decisions, as there may be many factors to consider. The examples below are given as a guide only.**

Project Case Study Example #1

A large London townhouse in London Belgravia, Grade 1 listed, with generous ceiling voids and a large plant room in the sub-basement as well as big M&E cupboards on each floor.

A lot of the lighting will be either decorative lighting or linear joinery lighting, with few LED downlights due to the building planning restraints.

The design is professionally done by an expert, and there is no private client. (It is a speculative development.)

Recommendation:	Reason for recommendation:
1-10V dimming for LED downlights, accent lights and linear lighting.	More cost-effective than DALI, and the typical DALI benefits are not applicable here, particularly as there are no issues with rack space, cable runs or possible client changes. Also, there are a lot of decorative lights that cannot be controlled via DALI.
Phase dimming for chandeliers and wall lights	The professional designers can ensure the lamps are suitable.
Non dim (switch on/off only) for all 5A circuits.	We do not know what floor / table lamps may be plugged in by the future buyers of the house, and these may be non-dimmable. It is safest to have these 5A circuits on NON-DIM modules rather than phase dimming modules.

Project Case Study Example #2

A townhouse in Brompton, London. Lutron racks will be housed on each floor in cupboards, but this is an issue as the private clients want maximum storage space for their belongings.

The house is not Graded by Heritage and the interiors are modern, with high proportion of LED downlights, linear details and accent lighting. (Including a colour change system in the basement spa complex.)

There is a lighting designer involved.

Due to the detailed design process and relatively small rooms, it is unlikely that the Client will ever change the lighting circuit configurations after installation is completed.

The Client has specified a challenging completion date, which will limit commissioning time.

Recommendation:	Reason for recommendation:
DALI dimming for LED downlights, accent lights and linear lighting.	This will allow the lighting control racks to be compact in size, thus maximising storage for the Clients.
DALI addressing should be in Broadcast groups, with each group wired back to the DALI modules in the same fashion as 1-10V wiring.	This will greatly reduce commissioning time as drivers do not need to be individually addressed. The lack of flexibility is acceptable due to the small room sizes, limited grouping options, high level of concept design input and the low risk of client changes after completion.
Phase dimming for pendants and wall lights	The professional designers can ensure the lamps are suitable.
Phase dimming for all 5A circuits.	The interior designers and Clients can liaise with the lighting designer to ensure that all table and floor lamps are fitted with suitable phase dimming lamps.
DMX control for the RGB lighting in the spa.	This will allow sophisticated programming and control via the networked system.

Project Case Study Example #3

A prime townhouse in Notting Hill, London, with 2 basements, very congested ceiling voids and vertical risers are very constrained in size.

Lutron racks will be housed in 3 locations over 7 floors.

The house is not Graded by Heritage and the interiors are classic contemporary, with a lot of architectural lighting. There is a lighting designer involved.

The Client has a fluid approach to the design, and likes to have a high degree of flexibility as this is their first project of this nature.

They will be living here with a young family and likely to do so for some years.

Recommendation:	Reason for recommendation:
DALI dimming for LED downlights, accent lights and linear lighting.	This will allow the lighting control racks to be as small as possible, and will also minimise the cable home-runs which will help with the riser and ceiling void restraints.
DALI addressing should be individual to each driver.	This will allow maximum flexibility to allow for future changes as the lifestyle needs of the family changes over the years. This also means that home-runs are minimised (unlike broadcast addressing.)
Phase dimming for pendants and wall lights	The professional designers can ensure the lamps are suitable.
Phase dimming for all 5A circuits.	The interior designers and Clients can liaise with the lighting designer to ensure that all table and floor lamps are fitted with suitable phase dimming lamps.

3.2 | Summary of when, and when not, to consider using DALI in High End Residential Projects

DALI dimming control should be considered for residential projects when:

1. The lighting groups may need to change in the future and cannot be predicted with a high degree of certainty at concept & design development stage. For example, if the lifestyle uses of rooms are not known or may change, the client wishes to retain a degree of flexibility, a professional lighting designer is not being used, or positions of artwork / furniture / objets d'art etc are not fixed.
2. There is limited physical space for lighting control racks and panels and they need to be as small as possible.
3. There is a lot of architectural lighting with complex scenes.
4. There are large open-plan rooms or areas with multiple uses and functions.
5. There is limited cable run space in risers, conduits, ceiling voids and other service areas.
6. A very wide range of dimming control is required, i.e. the final user may wish for lighting to be able to be dimmed to extremely low levels.
7. There is a fully networked lighting control system such as Lutron or Crestron.

DALI dimming control is probably NOT suitable for residential projects when:

1. There is a lot of decorative lighting which can only be controlled via phase dimming.
2. There is a lot of lighting that does not require dimming or cannot be dimmed.
3. There are significant cost restraints to the project.
4. It is a mid-range speculative development with no private client and therefore the flexibility of DALI is not an advantage and the costs may make it prohibitive.
5. The electrical contractors are not comfortable or experienced with DALI systems.
6. There is only a short space of time allowed for commissioning of the lighting control system. (DALI takes longer to programme.)
7. There is no networked lighting control system.
8. There is no complete re-wire and DALI cabling cannot be installed due to parts of the property that are not going to be included in the project.

Please note: a lighting professional or electrical engineer should always be consulted regarding dimming types on large projects, due to the often very substantial cost of control and lighting equipment.

SECTION 4 - Frequently Asked Questions (FAQ's)

4.1 | Design & User Questions

Can DALI dimming be used for chandeliers and decorative wall lights?

Typically this is not possible. It is rare to find chandeliers and wall lights that can be dimmed via DALI protocol. This is because most of these products are designed in traditional ways with 240V lampholders which therefore can only be dimmed via Phase dimming methods.

Some modern LED chandeliers and wall lights will have integral drivers, and sometimes these can be adapted to take DALI control. However, DALI drivers are often slightly larger than other types of drivers and may not physically fit into the luminaire. Occasionally there is an option to house the driver in a remote location or in the ceiling/wall void, but this is often not possible. DALI-to-Phase interfaces are available in the market but need suitable remote locations.

Are DALI drivers always bigger than phase dim or 0-10V drivers?

Typically DALI drivers are slightly longer than other types as they have more electronics on board. However, increasingly these drivers are becoming smaller and there are now a variety of compact DALI drivers available which can fit vertically into 150mm ceiling voids through downlight cut-outs.

Is it true that linear LED strips can NOT be dimmed via DALI control?

No, this is not true. 5-10 years ago there were very few DALI drivers capable of effectively controlling 12V and 24V DC LED lightsources (such as flexible LED strip), but manufacturers such as EldoLED, Osram and Meanwell are now producing highly effective DALI drivers for linear LED systems. DALI is now a common dimming protocol for linear LED strips.

Is it easy to change group configurations after a DALI installation is complete?

Although this is a relatively straightforward process with lighting control systems, it can be very time-consuming and may be expensive if you are paying for professional programmers to do this. It is always best to spend more time at design stage and to get the groupings right from the start!

How many lights can be put together on a single physical DALI cable?

64 DALI devices is the maximum number of units per DALI cable. For example, you may have a DALI loop in a residential projects with:

- 40 x individual ceiling DALI LED downlights
- 5 x DALI drivers for recessed floor uplighters
- 5 x DALI drivers for LED recessed wall stairlights.
- 14 x DALI drivers for LED linear strip systems such as joinery lighting.

This is then up to maximum and you need to start another physical cable run for the next set of DALI devices. Please note you can only have a maximum of 16 groups of lights per loop.

This info on the number of units per DALI cable applies if you are individually addressing each DALI unit.

(Broadcast addressing requires separate DALI cable runs for each group, so if for example you require 10 groups with 6 lights in each it is necessary to run 10 x DALI loops from the controller. This method speeds up the commissioning but reduces flexibility and is more inefficient on installation time and cabling costs.)

What is a 'bus' line in an electronic / electrical installation jargon?

A bus line is a communication cable that transfers data between devices. It is a transmission path on which signals are dropped off or picked up at every device attached to the line. Only devices addressed by the signals pay attention to them; the others discard the signal.

(The term is derived from its similarity to buses in a town or city that pick up or drop off passengers at each bus stop along the route.)

Are all DALI drivers only suitable for logarithmic dimming?

No, many high quality DALI drivers can be programmed for linear dimming if required, although logarithmic dimming is generally preferred for residential projects.

4.2 | Cost Questions

What are the cost factors that should be considered when deciding whether to specify a DALI system as opposed to another type of dimming protocol?

The following cost factors should be collated by the project QS from different professionals, to obtain a full comparison between a DALI install and, for example a 1-10V + Phase dim install:

1. **Consultants' fees in designing the system.** (Obtain costs from the lighting consultant, the M&E consultant, and the AV/lighting control consultant.) Fees may be slightly higher for a DALI system.
2. **Procurement costs for the lighting control equipment.** (i.e. the Lutron system or similar.) Costs may be slightly higher for a DALI system from some manufacturers.
3. **Procurement costs for the luminaires and drivers.** Costs may be slightly higher for a DALI system from some manufacturers.
4. **Costs of cables and other electrical materials.**
5. **Cost of installation.** (Labour only.)
6. **Cost of programming & commissioning** the lighting control system.
7. **Call-out costs** if you do choose to reconfigure / re-programme your system at a future date after the original commissioning is completed.

Do DALI drivers cost more than 1-10V drivers?

DALI drivers are slightly more expensive to purchase from some manufacturers than 1-10V drivers, but the gap is rapidly closing and many downlight manufacturers (such as Orlluna) now have identical prices for both options.

4.3 | Technical & Installation Questions

What are the technical parameters and limits of DALI?

- Maximum number of DALI units: 64
- Maximum number of DALI groups: 16
- Maximum number of DALI scenes: 16
- DALI voltage: 9.5-22.5V, typically 16V.
- DALI system current: max 250mA (depending on the installed DALI power supply.)
- Data transfer rate: 1200 baud
- Maximum cable length: the max cable length depends on the max permitted voltage drop along the DALI cable; this is defined as 2V max. This corresponds to a maximum cable length of 300 metres for a line cross-section of 1.5mm².
- Contact resistances must also be taken into consideration. A voltage drop of 2V must not be exceeded.
- DALI is NOT SELV, so installation instructions for 240V must be followed.

Does polarity matter on the driver connections?

No, polarity does not need to be observed with a DALI pair.

Which cable topologies are suitable for DALI?

- ✓ Line, star, tree and bus are suitable.
- X Topologies such as ring, mesh and fully connected are NOT suitable.

Can the DALI control line be routed in the same cable as the power supply?

Yes, the DALI system is installed using standard installation material for mains voltage, plus 2 wires are needed for the DALI control circuit. The line voltage and bus line may be routed in the same cable.

What happens in a DALI circuit if a wire with a cross-section of 0.75mm² is used instead of the recommended cross-section of 1.5mm²?

The maximum possible cable length is reduced to about 150 metres instead of the 300 metres that can be achieved with a 1.5mm² cross-section.

How many DALI groups can be programmed in a large open-plan space, and are there any limits to this?

We recommend that in any large visually open space, the number of DALI groups per loop is limited to 8. (not the 16 that is digitally possible.) The reason for this is that with more than 8 groups you can see a 'popcorn' (ripple delay) effect when the groups are turned on. Groups that are furthest from the LCP (lighting control panel) processor can take longer to come on, and there are a lot of commands going down the cables, resulting in a slightly disjointed visual experience for the user. However, with up to 8 groups this effect is not noticeable.

Please note that if you need more than 8 zones in an open plan space, this is easily achievable by adding more DALI loops. The limit is on the 8 zones (programmed sub-groups) per loop. There is no limit to the number of loops you can have.

If a DALI driver fails after install, will the end user then need to call out a specialist AV engineer who will charge them to re-address and assign the replacement DALI driver?

Usually not – most intelligent DALI lighting control systems have a short-term memory function (ranging from a few weeks to a few months, depending on the manufacturer) which can automatically re-assign the original DALI address to a new device that replaces a faulty item.

The DALI system 'remembers' that a device has failed, and saves the address number ready for the replacement driver. This means that no specialist re-programming of the driver is required, and it can be replaced by any regular electrician or maintenance engineer as if it was a basic non-dim driver or component.

N.B – this only works if there is only ONE failed unit on the DALI loop. If 2 units or more fail before the first failure is rectified, then the system is unable to know which address belongs to which location and the DALI sub-groups will all need to be re-programmed by a DALI programmer. Also, if the fault is left for too long then the saved address will be erased.

Lighting control manufacturers will be able to advise if this clever and useful function is available on their processor, and for how long the memory will hold the digital DALI address of the failed driver or device.



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