



## DALI - Commands

A DALI controller can send different types of commands to a fixture (rather than just level values) and therefore needs a different method to DMX to achieve this.

### Data structure

DALI is a serial protocol based on Manchester Coding. It has a baud rate of 1,200 bits per second (in comparison, DMX has a baud rate of 250,000 bits per second).

Below is the simplified packet that DALI uses.

Address (who)	Command (what)	Data (how much)
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A DALI controller will send a packet for every change it needs to make.

The first part of the packet is the short address of the fixture, unless it is broadcasting its message.

The second part is the type of command.

The third part is the value (this is not always needed).

This allows the controller to send a vast number of different commands - such as level, discovery and queries - to a device using the same structure.

### Addressing modes

When controlling ballast/device levels, there are four commonly used addressing modes. These are:

- Broadcast – A broadcast message can be sent to all devices to respond to the given value, e.g. Broadcast 50%
- Channel – Individual control over the 64 separate devices (Values: 0% to 100%) e.g. Channel 32 @ 100%

- Group – Each device can be assigned to any of 16 groups. It can be assigned to more than one group, e.g. Group 10 @ 95%
- Scene - Every device can store up to 16 scenes that can be controlled via a single command, e.g. Scene 2 Go

Only one command can be sent per packet so, in order to refresh all 64 devices with different values, 64 separate commands must be sent. This can take up to a second, so DMX-style fast dimming cannot be achieved. Instead, DALI allows a fade time to be specified.

Light output levels are commonly referred to as percentages (fluorescent lamps usually have low resolution fade profiles which do not require the precision of a decimal number).

### Commands

The table on the next page lists the DALI commands that are commonly used. Several of these can be sent to individual channels or broadcast to the entire subnet.

A key feature of DALI is its ability to get information back from the ballasts; therefore, some commands can be queries or 'set' instructions.

Note that DALI commands that are used for discovery and programming are not included in the table.



## Common DALI Commands

Command	Addressing Mode	Details
Direct Arc Value	Broadcast / Groups / Channels	Send direct level values
Off	Broadcast / Groups / Channels	Send the off command
Up	Broadcast / Groups / Channels	Increase value by 1 until Max Level, honouring the fade time
Down	Broadcast / Groups / Channels	Decrease value by 1 until Min Level, honouring the fade time
Step Up	Broadcast / Groups / Channels	Increase value by 1 until Max Level, ignoring the fade time
Step Down	Broadcast / Groups / Channels	Decrease value by 1 until Min Level, ignoring the fade time
Recall Max Level	Broadcast / Groups / Channels	Output Max Value
Recall Min Level	Broadcast / Groups / Channels	Output Min Value
Step Down and Off	Broadcast / Groups / Channels	Decrease value by 1 /Turn off
On and Step Up	Broadcast / Groups / Channels	Turn on / Increase by 1
Go to Scene x	Broadcast / Groups / Channels	Go to Scene Command
Status	Channels	Is there a Device using this Short Address?
Device	Channels	Status of the Device
Lamp Power On	Channels	Is the Lamp on?
Version Number	Channels	Replies: Current Version
Device Type	Channels	Replies with the device type
Actual Level	Channels	Query Current Level
Max Level	Channels	Query or Set
Min Level	Channels	Query or Set
Power On Level	Channels	Query or Set
System Failure Level	Channels	Query or Set
Fade Time / Fade Rate	Channels	Query or Set
Scene Levels	Channels	Query or Set