



# Rail-DALI-DMX

## Quick Start Guide

The full User Guide can be downloaded via the following link:



## Summary

Rail-DALI-DMX converts DALI into DMX512. It is designed for environments that require integration between the two protocols.

There are 2 main modes of operation: Ballast mode and Trigger mode.

1. Ballast mode (DIP Switch 6 OFF) enables control of DMX fixtures by a DALI controller. It does this by simulating virtual ballasts, each of which has control over a single DMX channel.
2. Trigger Mode (DIP Switch 6 ON) is used to trigger a DMX controller.

## DALI Essentials

- Max 64 ballasts per bus (= one circuit)
- DALI BUS PSU required to provide voltage on line (in addition to regular PSU)
- Ballasts used for the first time must be commissioned (using e.g. Dali-Scope)
- DALI offers 4 types of control over ballast intensity: individual channel, group, scene and broadcast

## Commissioning

As with any DALI product, the Rail-DALI-DMX must be commissioned to give each virtual ballast a unique short address.

The choice of short address depends on what ballasts are already present on the network. If no short addresses are taken up already, the default course would be to assign sequential short addresses starting at 1.

If the Rail-DALI-DMX is not commissioned, it can still control the DMX fixtures when receiving DALI broadcast commands. This can be useful during the installation phase prior to commissioning to check that the system is responding.

## Conventions

In this document, for clarity, we number DALI ballasts 1-64, and Groups and Scenes 1-16. On the wire, these actually appear as 0-63 and 0-15 respectively. Most DALI commissioning tools use the latter numbering system.

## Ballast Mode

In Ballast Mode, the virtual ballasts act in the same manner as normal DALI ballasts and respond to a sub-set of the standard DALI commands (see User Guide Appendix: DALI Commands - Overview). All intensity control commands are supported (individual channel, group, scene and broadcast).

Rail-DALI-DMX offers the user the option to simulate 1, 4, 16 or 64 ballasts. The choice is made via setting DIP switches 3 and 4 as shown in Table 1. The DMX channels that are not being used are set to zero.

If the total number of virtual ballasts is changed, the commissioning procedure must be carried out again.

DIP Switch 3	DIP Switch 4	Total no. of Virtual Ballasts
Off	Off	1
Off	On	4
On	Off	16
On	On	64

Table 1

The product assigns each virtual ballast a number that defines the output slot for the DMX data as shown in Table 2. These numbers are pre-programmed; however, the system does allow editable short addresses via commissioning.

Virtual Ballast No.	DMX Data Slot
1	1
2	2
3	3
4	4
5	5
⋮	⋮
63	63
64	64

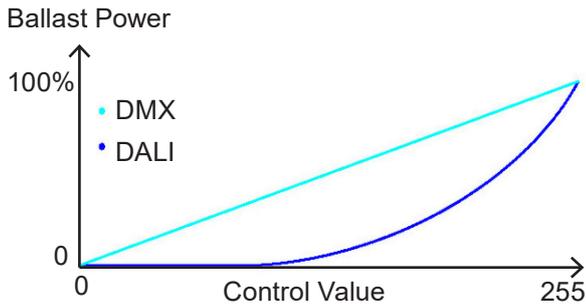
Table 2

## Dimming Curve

The majority of DMX devices operate using a linear dimming curve with the level selected by a decimal value between 0 and 255.

DALI works with a non-linear (exponential)

curve. Each method produces a different output, as shown by the graph below.



Rail-DALI-DMX offers the user the ability to adjust the response curve of the DMX output in order to mimic that of DALI ballasts.

The choice is set using DIP switch 5. OFF means no curve correction, while ON will apply the exponential curve correction. The correction affects all control modes (Broadcast, Channel, Group & Scene). The correction is an approximation; due to the nature of the conversion the top end is steppy.

## Fade Times

In Ballast Mode, Rail-DALI-DMX offers three fade times of 0 (instant), 1 or 4 seconds. Other input values of fade times are treated as 0 (instant). Simulated fades only happen when 'Direct Arc Power' commands and 'Go To Scene' commands are used.

Fade times are selected on a 'per virtual ballast' basis using a tool such as Dali-Scope. Fade times allow the virtual ballast to perform a simulated fade when they receive a commanded to adopt a new level. A one-second fade executes using a fade ramp of approximately 30 steps, while a four-second fade uses a fade ramp of approximately 120 steps (note that this feature applies to products with serial numbers above 0129).

## Trigger Mode

Trigger Mode is used to trigger a DMX controller. It enables integration between existing DALI installations and DMX systems.

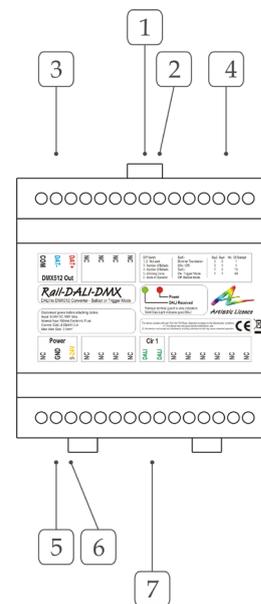
Trigger Mode also uses virtual ballasts but, in contrast to Ballast Mode, they are not proxies for actual fixtures. As such, the DALI control commands Channel, Group and Scene lose their literal meaning. Instead, they should be viewed simply as data streams that enable various triggering options.

The virtual ballasts are pre-commissioned to define this triggering structure. Appendix Tables 3-6 in the User Guide detail the pre-programmed relationship between the virtual ballasts and the DMX output slots.

The number of virtual ballasts can be set as shown in Table 1.

The Dimming Curve Translation (DIP Switch 5) is operative for Channels and Groups. Again, it should be remembered that, in trigger mode, there is no concept of this describing actual fixture intensity levels.

## Connections



No.	Type	Function
1	LED	DALI Received
2	LED	Power
3	Connection	DMX Output
4	DIP Switch	See below
5	Power Input	GND Connection
6	Power Input	9 - 24 VDC
7	Connection	DALI Connection

Dip Switch	Function
1	Not Used
2	Not Used
3	No. of virtual ballasts (see Tab.1)
4	No. of virtual ballasts (see Tab.1)
5	Dimming Curve (OFF: No correction ON: Exponential correction)
6	Operation Mode (OFF: Ballast / ON: Trigger)

## Troubleshooting

No power light	<ol style="list-style-type: none"> <li>1. Check that the DC power wires are connected to the correct terminals and correct polarity.</li> <li>2. Check power is switched on.</li> <li>3. Disconnect all non-power cables. Switch off product and leave for 20 minutes (this allows the thermal fuse to reset). Switch on. If power light illuminates, it is likely that an external fault or wiring error is causing the problem.</li> </ol>
DALI controller is not 'seeing' Rail-DALI-DMX	<ol style="list-style-type: none"> <li>1. Product not powered on.</li> <li>2. No DALI bus PSU present.</li> </ol>
DMX fixtures can only be controlled by DALI broadcast commands	<ol style="list-style-type: none"> <li>1. The Rail-DALI-DMX has not been commissioned. Use a DALI tool such as DALI-Scope to achieve this.</li> </ol>
The data light on Rail-DALI-DMX is not illuminated	<ol style="list-style-type: none"> <li>1. Product not powered on.</li> <li>2. No DALI bus PSU present.</li> <li>3. DALI controller not connected.</li> </ol>
Scene and Group commands not working	<ol style="list-style-type: none"> <li>1. Scene and Group commands are handled differently in Trigger Mode. Try switching to Ballast mode (set DIP switch 6 OFF).</li> <li>2. Scenes and Groups have not yet been programmed.</li> </ol>
DMX fixtures behaving erratically	<ol style="list-style-type: none"> <li>1. DMX cable not terminated at last fixture.</li> <li>2. DMX cable is not suitable (must be data cable).</li> <li>3. More than 32 DMX fixtures on the cable.</li> </ol>
When I cycle power to my DALI ballast, it powers up at an unexpected intensity	<ol style="list-style-type: none"> <li>1. All DALI ballasts have a setting called 'Power On Level' which defines their intensity after power cycle. The ballast will stay at that intensity until Rail-DALI-DMX next refreshes it. Dali-Scope can be used to both read and programme the Power On Level.</li> </ol>
When I cycle power to my DALI bus power supply, the ballasts go to unexpected intensities	<ol style="list-style-type: none"> <li>1. All DALI ballasts have a setting called 'System Failure Level' which defines their intensity after a fault such as loss of DALI bus power supply. The ballast will stay at that intensity until Rail-DALI-DMX next refreshes it. Dali-Scope can be used to read the ballast's System Failure Level. If power is not reinstated after 1s, all the relevant DMX outputs will flash at full intensity.</li> </ol>



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**CE Compliance**



Rail-DALI-DMX is CE compliant when installed in a shielded and earthed metal case

Customer support and knowledge base:  
[www.ArtisticLicence.com/support.html](http://www.ArtisticLicence.com/support.html)

