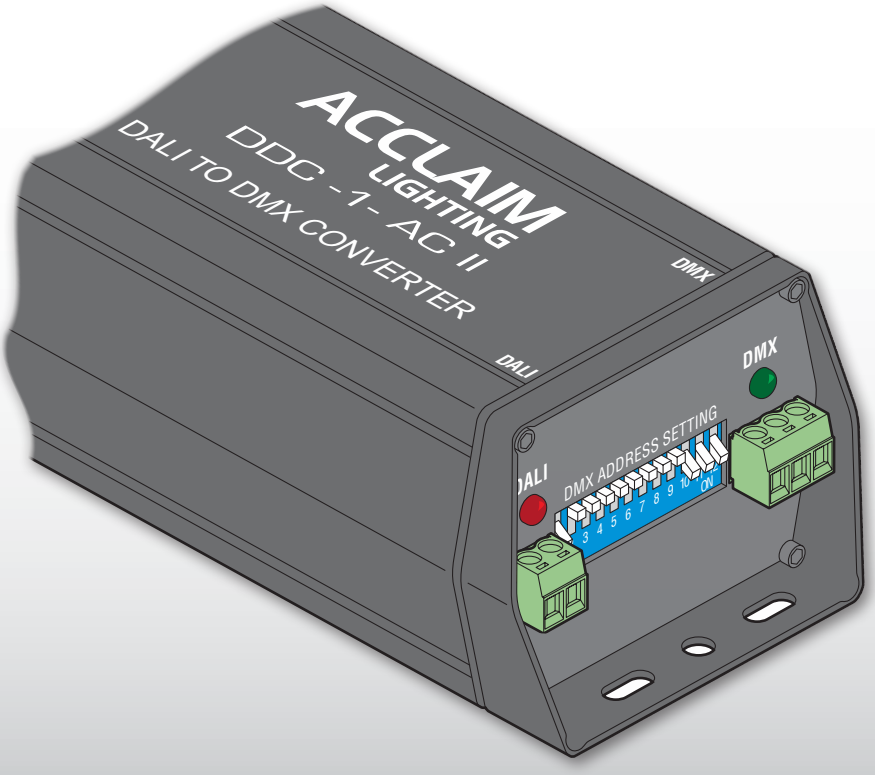
ACCLAIM
LIGHTING




# DDC-1-AC™

User guide

# CONTENTS

# INTRODUCTION

## WELCOME

Welcome to the DDC-1-AC DALI ⇌ DMX converter from Acclaim Lighting, a device which efficiently bridges the gap between the worlds of DMX and DALI lighting control. Please see the Overview on page 3 for more details.

## SAFETY

- Ensure that the power input is supplied from a correctly fused, earthed and environmentally protected location.

## MAINTENANCE

***CAUTION: Always isolate mains power before starting maintenance operations.***

- Ensure that all mounting (and device) screws/bolts are fully tight and free of corrosion.
- Ensure there is no deformation to the housing, lenses or fixing points.
- Check that all power supply cables are free from physical damage or material fatigue.
- Use only genuine spare parts supplied by Acclaim Lighting.

## CLEANING

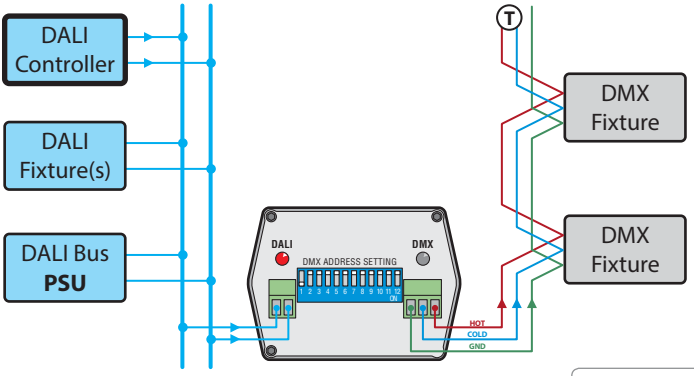
- Use a moist, lint-free cloth when cleaning each fixture.
- Never use alcohol or solvents.

## OVERVIEW

The DDC-1-AC unit operates in either of two modes to bridge the divide between DALI and DMX.

### DALI TO DMX

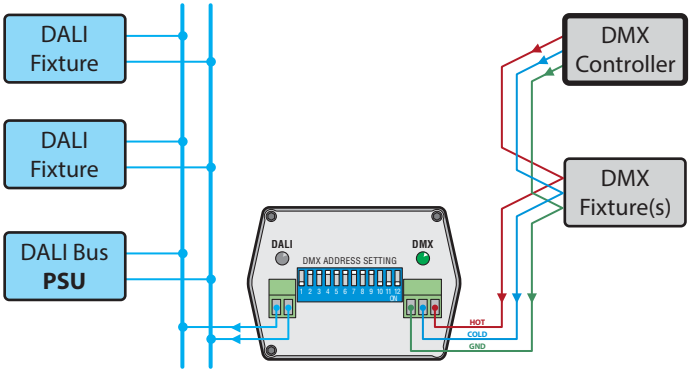
In this arrangement, 8-bit dimming signals received on the DALI bus are converted and output via the DMX port. When a valid DALI signal is being received the red indicator will flash continuously.




To select DALI to DMX conversion, switch 12 must be OFF (up).


### DMX TO DALI

In this arrangement, 8-bit dimming signals received on the DMX bus are converted and output via the DALI port. When a valid DMX signal is being received the green indicator will flash continuously.




To select DMX to DALI conversion, switch 12 must be ON (down).


*Note: For clarity, mains power inputs are not shown in the diagrams, but would be required at the controllers, the fixtures, the DALI PSU and the DDC-1-AC unit.*

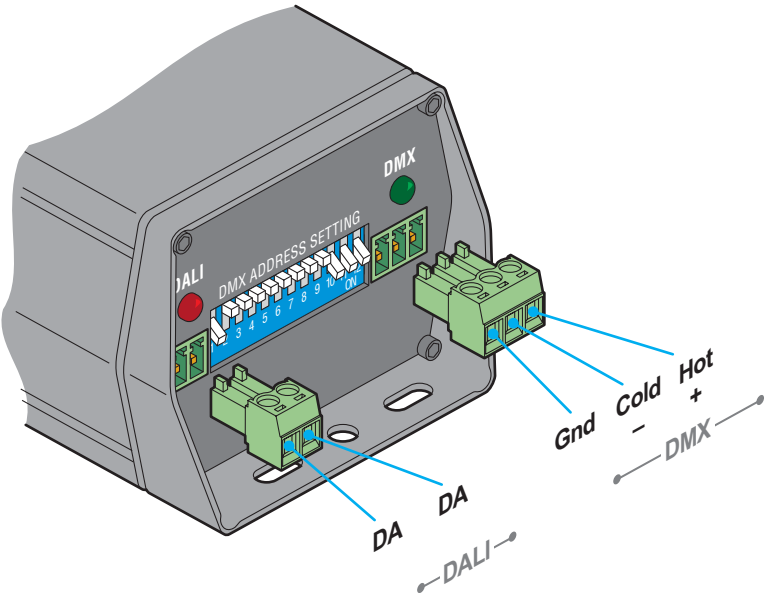
# INSTALLATION

## MOUNTING

The DDC-1-AC converter can be mounted in any orientation, as required. Two holes (Ø0.2"/Ø5mm) plus four slotted holes (Ø 0.18 x 0.31"/Ø4.5 x 8mm) are built into the base for mounting purposes (see page 10 for dimensions).

## DATA CONNECTIONS

Connections to the two data busses are made via pluggable 3.5mm-pitch PCB connectors; with a 2-way plug for the DALI connection and a 3-way plug for the DMX link. The contact ports of each connector are suitable for cable cores in the range 24 to 14 AWG (0.2 to 2.08mm$^2$).

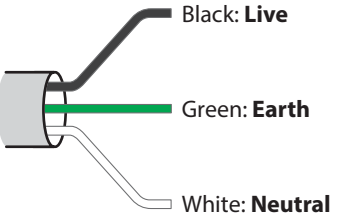



## POWER

The power cord is roughly 4.5 feet (1.4m) in length.
The power requirements are as follows:

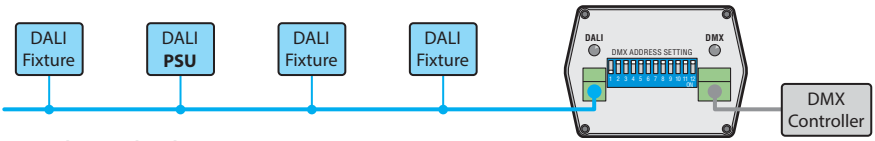
- Voltage: 100-277VAC 50/60Hz (autosensing)
- Power: 1W

The power cord color designations are as shown here:



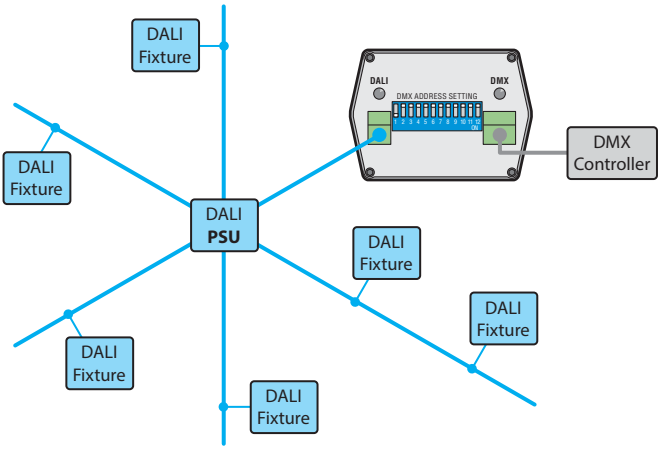
## DALI LAYOUT

The DALI standard offers a great deal of flexibility in its layout; standard 2-core cabling is used and up to 64 fixtures can be arranged in a variety of topologies, including a linear bus, a star, or a mixture of both. No termination is used anywhere in the layout and the polarity of the 2-wire connections are unimportant.




**A simple DALI bus layout**

**A DALI star layout**

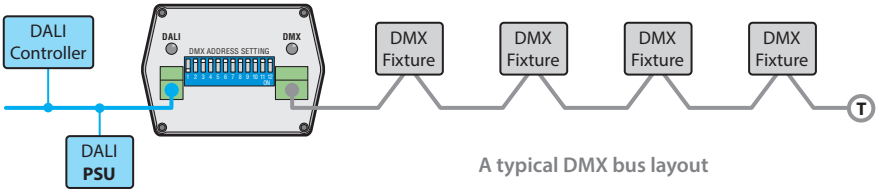



## TIPS FOR ACHIEVING SUCCESSFUL **DALI** CONTROL

- Do not exceed a total of 64 devices/fixtures.
- Many types of suitably insulated two-core cables (with a recommended gauge of 16 AWG / 1.5mm$^2$) can be used to transmit DALI signals.
- Do not exceed a total cable length of 984 ft (300m).
- If a cable with a cross sectional area of less than 16 AWG / 1.5mm$^2$ is used, the maximum length may need to be reduced in order to avoid a voltage drop of greater than 2V. A 20 AWG / 0.75mm$^2$ cable would reduce the maximum length to roughly 492 ft (150m) while a cable with a cross sectional area of 22 AWG / 0.5mm$^2$ would limit the maximum length to less than 328 ft (100m).
- Thanks to the slow bit rate and ELV categorization, DALI cables can be run alongside mains supply cables without issue.
- DALI devices can be arranged in linear or star configurations - or even mixtures of the two.
- DALI connections are polarity independent; each DALI device is protected by an internal bridge rectifier.
- A power supply must be present somewhere along the DALI bus. The power supply should provide an output of 16V and must be regulated to a maximum current output of 250mA. It is best to situate the power supply towards the middle of long runs in order to minimise voltage drops. The voltage drop must not exceed 2V at any point.

## DMX LAYOUT

DMX provides much higher data speeds than DALI and as a result imposes much stricter cabling requirements. A linear bus must be formed, using very specific cable types (see below), which must be terminated at each end (the DDC-1-AC unit is internally terminated). Polarity of all connections is critical and up to 32 fixtures can be connected along the bus. Any branches from the main bus must be kept to an absolute minimum and active buffering is required to connect more than 32 fixtures or to create a Y-split.




A typical DMX bus layout

## TIPS FOR ACHIEVING SUCCESSFUL **DMX** CONTROL

- Do not exceed a total cable length of 3,900 ft (1200m) without buffering.
- Do not exceed a total of 32 devices/fixtures on a single line without buffering.
- Use only connection cables with a characteristic impedance of 120Ω, preferably where the DMX + and DMX – data lines are twisted around each other and the ground link exists as a coaxial screen surrounding the inner cores, such as Belden® 9842 or equivalent.
- Connect a 120Ω terminating resistor between the DMX + and DMX – output connections of the final fixture.
- Do not introduce a passive Y-split into the control cabling. If it is necessary to split the control link in order feed fixtures located in different directions, use a powered DMX splitter/buffer.
- Ensure that the DMX + and DMX – connections do not become crossed at any point.

# CONFIGURATION

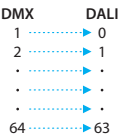
DALI operates at just 1200 bits per second; this slow speed means that it will remain robust and reliable when transmitted across standard cabling (with no termination); its control cables can be run alongside high voltage power feeds and its devices can be arranged in mixed topologies. Compare this against the much faster speed of 250,000 bits per second for DMX; making DALI roughly 200 times slower. DMX is a streaming protocol, meaning that the values for each of its 512 channels are continually re-transmitted, roughly 44 times every second. By contrast, DALI is a vector protocol, which means that a command is only transmitted when a change occurs.

When converting from DMX to DALI, the wide mismatch between the speeds of the two protocols means that care should be taken to minimise complex dimming changes across multiple DALI fixtures. Attempts to reproduce subtle colour changes or real-time fades across individual DALI fixtures will result in very 'steppy' and unattractive results. This is caused by interim values being discarded because the DALI bus cannot keep pace.

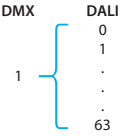
## DMX TO DALI MODES

In DMX to DALI mode, the DDC-1-AC unit supports two DALI control modes:

- **Channel** - [sw10: ON, sw11: ON] In this mode, the 64 DALI channels will be assigned to 64 separate DMX channels (beginning at the chosen start address) to provide maximum control flexibility. However, this mode will impose the largest data overhead on the DALI bus and could produce unattractive results.




- **Broadcast** - [sw10: ON, sw11: OFF] In this mode, all of the 64 DALI channels will be assigned to the single DMX channel that is chosen using the start address switches. This will provide the best response times as only a single set of instructions need to be issued across the whole DALI bus. However, all of the fixtures will respond in the same way.

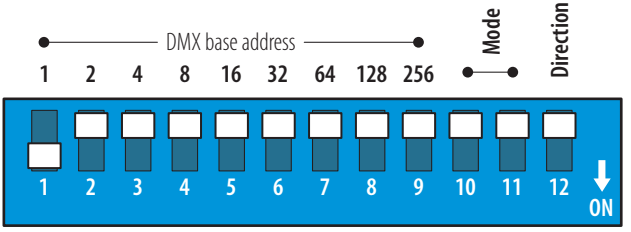



See page 8 for more details about switch settings.

### NOTES

- DALI addresses are numbered from 0 to 63, whereas DMX channels are numbered from 1 to 512.
- If the DMX signal is lost, all DALI fixtures will return to their off condition.
- RDM signals present on the DMX bus are not passed across the conversion process.
- Query commands on the DALI bus are not passed across the conversion process.

## SWITCH SETTINGS




*Note: Changes can be made to the switch settings while power is applied and the unit will respond accordingly.*

- Switches 1 to 9: ***DMX base address***
- Switches 10 & 11: ***Mode***

| | ***10*** | ***11*** | ***(DMX to DALI direction only)*** |
|---|---|---|---|
| | ON | ON | Channel mode (64 DMX to 64 DALI) |
| | ON | OFF | Broadcast mode (1 DMX to 64 DALI) |

*Note: In DALI to DMX mode, switches 10 and 11 are ignored.*

- Switch 12: ***Direction***

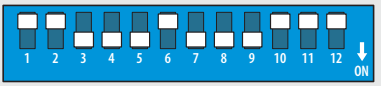
| | ***12*** | |
|---|---|---|
| | OFF | DALI to DMX conversion |
| | ON | DMX to DALI conversion |

## CONFIGURATION EXAMPLES

### To convert DALI input signals into DMX outputs:

- *Direction:* *DALI to DMX*
- *DMX base address:* *35 (DALI channels 0 to 63 separately control DMX channels 35 to 98)*

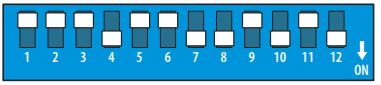
*The switch block would need to be configured like this:*




### To convert DMX input signals into DALI outputs (using Broadcast mode):

- *Direction:* *DMX to DALI*
- *DMX base address:* *100*
- *Mode:* *DALI Broadcast (DMX channel 100 controls DALI channels 0 to 63)*

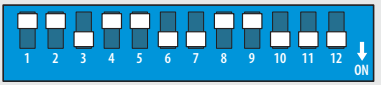
*The switch block would need to be configured like this:*




### To convert DMX input signals into DALI outputs (using Channel mode):

- *Direction:* *DMX to DALI*
- *DMX base address:* *200*
- *Mode:* *DALI Channel mode (DMX channels 200 to 263 separately control DALI channels 0 to 63)*

*The switch block would need to be configured like this:*

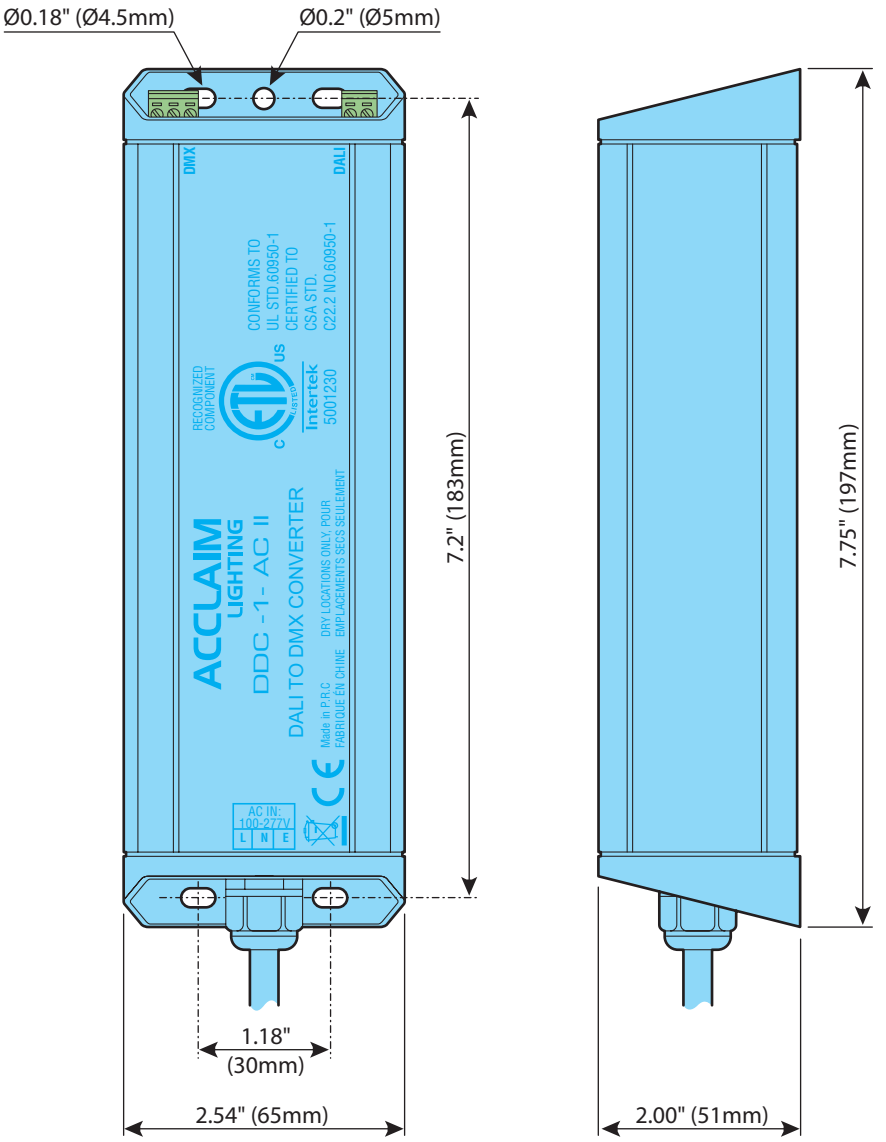


# FURTHER INFORMATION

## SPECIFICATIONS

| | |
|---|---|
| Operating Voltage | 100-277VAC, 50/60Hz |
| DALI Input / Outputs | 1 |
| DMX Input / Outputs | 1 |
| Maximum Control Channels | 64 DALI and 64 DMX |
| Protocols | DALI and DMX-512A |
| Power Consumption | 8.3mA, 1W at 120VAC |
| Finish | Black |
| Housing Material | Extruded aluminum |
| IP Rating | IP20, dry location |
| Operating Temperature | 14°F to 122°F (-10°C to 50°C) |
| Fixture Connectors | Attached 4.5ft (1.4m) lead for AC input<br>Terminal blocks for DMX and DALI |
| Certifications | |

## DIMENSIONS




Weight: 0.8 lbs (362g)

## LIMITED PRODUCT WARRANTY

A. Acclaim Lighting™ hereby warrants, to the original purchaser, Acclaim Lighting finished products to be free of manufacturing defects in material and workmanship for a standard period of:

- Fixtures: 5 Years (1,825 days) from the date of purchase.
- Drivers, power supplies and accessories: 5 Years (1,825 days) from the date of purchase.
- Flex Products: 3 Years (1,095 days) from the date of purchase.
- Controllers: 2 Years (730 days) from the date of purchase.

It is the owner's responsibility to establish the date and place of purchase and warranty terms by acceptable evidence, at the time service is sought.

B. For warranty service, send the product only to the Acclaim factory. All shipping charges must be pre-paid. If the requested repairs or service (including parts replacement) are within the terms of this warranty, Acclaim Lighting will pay return shipping charges only to a designated point within the United States. If the entire instrument is sent, it must be shipped in its original package. No accessories should be shipped with the product. If any accessories are shipped with the product, Acclaim Lighting shall have no liability whatsoever for loss of or damage to any such accessories, nor for the safe return there of. Acclaim reserves the right to replace the item with same or similar product at its discretion.

C. This warranty is void if the serial number has been altered or removed; if the product is modified in any manner which Acclaim concludes, after inspection, affects the reliability of the product; if the product has been repaired or serviced by anyone other than the Acclaim Lighting factory unless prior written authorization was issued to purchaser by Acclaim Lighting; if the product is damaged because not properly maintained as set forth in the instruction manual.

D. This is not a service contract, and this warranty does not include maintenance, cleaning or periodic check-up nor do we guarantee as part of this warranty any lumen performance during period. Parts not covered by this warranty include: fuses, external power supplies, third party items not manufactures by Acclaim lighting. During the period specified above, Acclaim Lighting will replace defective parts at its expense, and will absorb all expenses for warranty service and repair labor by reason of defects in material or workmanship. The sole responsibility of Acclaim Lighting under this warranty shall be limited to the repair of the product, or replacement thereof, including parts, at the sole discretion of Acclaim Lighting. At no time will installation or re-installation or products labor or liability costs will be assumed by Acclaim Lighting. All products covered by this warranty were manufactured after January 1, 2012, and bear identifying serial number marks to that effect.

E. Acclaim Lighting reserves the right to make changes in design and/or improvements upon its products without any obligation to include these changes in any products theretofore manufactured No warranty, whether expressed or implied, is given or made with respect to any accessory supplied with products describe above. Except to the extent prohibited by applicable law, all implied warranties made by Acclaim Lighting in connection with this product, including warranties of merchantability or fitness, are limited in duration to the warranty period set forth above. And no warranties, whether expressed or implied, including warranties of merchantability or fitness, shall apply to this product after said period has expired.

F. Marine or extreme weather location applications using Acclaim lighting products are subject to a 2 year limited warranty and Acclaim must be notified prior to delivery of units for such applications so that preventative treatment can be made to the products to ensure proper performance and product life with a special marine code coating / sealing process at an additional cost.

G. The consumer's and or dealer's sole remedy shall be such repair or replacement as is expressly provide above; and under no circumstances shall Acclaim Lighting be liable for any loss or damage, direct or consequential, arising out of the use of, or inability to use, this product. This warranty is the only written warranty applicable to Acclaim Lighting products and supersedes all prior warranties and written descriptions of warranty terms and conditions heretofore published.

www.acclaimlighting.com