

**Installation & Wiring Instructions for
NDA Module (DALI)**

Description:

The Lite-Plan's NDA range of DALI LED emergency lighting modules have complete DALI functionality (to IEC 62386-202: Self Contained Emergency Lighting) and will also default to Self-Test operation if not connected to a DALI network. The units are designed to convert a wide range of LED types with two versions, the NDA/3 for converting most standard LED luminaires and arrays containing from 2 to 20 LEDs in series, whilst the NDA/3/80 extends the range by converting from 6 to 30 LED's in series.

The NDA range is designed to be installed by breaking into the low voltage connection between the mains LED Driver and the LEDs and allows the LEDs to be operated as normal under mains healthy conditions and operated at reduced light output in an emergency.

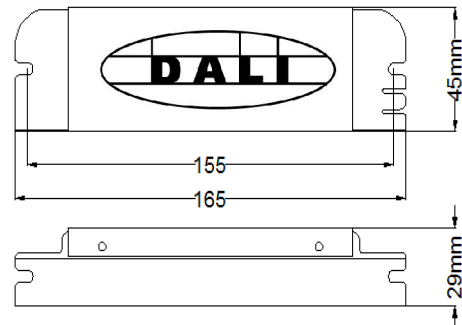
The NDA range automatically adjusts the output LED current to provide the best match between the battery and the load, providing maximum illumination whilst ensuring full battery duration. The NDA range is compatible with a wide range of lighting LEDs such as Philips Fortimo DLM, SLM and LLM ranges, Bridgelux LS/ES/RS ranges, Citizen 4-41W ranges, GE Infusion, Xicato and many others.

Specification

Supply Voltage	220-240 Volts AC 50/60 Hz
Power Rating	5.0 Watts
Power Factor	0.9
Duration	3 hours
LED Current Limit	320mA
Ambient Temp.	0°C to + 50°C
Max Case Temperature *	70°C
Max Battery Temperature	55°C
Terminal Blocks	0.5-1.5mm ² Screw Terminal
Battery Fuse	Internal
Supply Fuse	Not fitted
Battery Pack	3 x 4.5Ah D Cell Ni-Cd
Charge Current	200mA
Recharge Period	24 Hours
Module Size (L x W x H)	165mm x 45mm x 29mm
Module Fixing Centers	155mm
Battery Details (mm)	
Type T1 – Single Stick	220 x 37 x 37 FC 205mm
Type T2 - Side by Side on Plate	100 x 60 x 35 FC 32x40mm
Overall Weight	0.75 Kg

*Geometric centre of side of case.

NDA/3	LED Voltage Range	6 – 55 Volts
	No. of LEDs in series	2 -20
	U-OUT = 60V	
NDA/3/80	LED Voltage Range	15 – 80 Volts
	No. of LEDs in series	6 -30
	U-OUT = 90V	



Important

It is recommended that the module is installed by a competent person ensuring the installation complies with the necessary standards. Lite-Plan accept no responsibility for injury, damage or loss, which may arise as a result of incorrect installation, operation or maintenance.

The conversion requires an unswitched supply for charging the battery and a switched supply for a maintained conversion.

ISOLATE BOTH MAINS SUPPLIES AND DISCONNECT THE BATTERY BEFORE INSTALLATION OR MAINTENANCE. High voltage could be present at the output terminals if the battery is not isolated.

THIS MODULE MUST BE EARTHED VIA CAN

Conversion

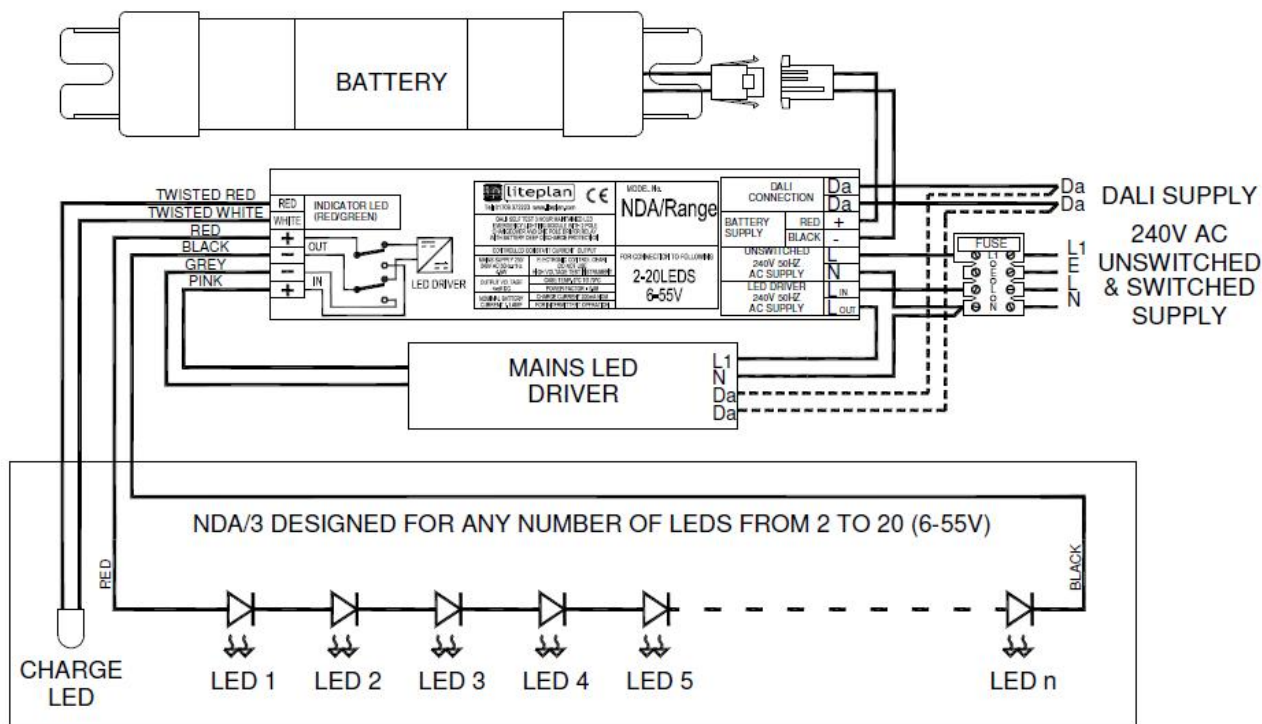
When converting a luminaire observe the following points:-

1. Fit the module & battery pack into the existing luminaire ensuring that they will operate within their temperature ratings.
2. If the module & battery pack do not fit integrally, then a remote conversion can be used. Ensure that the interconnecting loom is kept as short as possible.
3. Wire the module & battery into the luminaire as per wiring diagram on Pg. 2.
4. Ensure that the Switched Live feed is connected to Lin terminal on the module and the Live feed to the LED Mains driver is fed from the Lout terminal.
5. Arrange the wiring to avoid running the 240 Volt cables next to the modules output to the LED(S) to obtain the best EMC results.
6. Requirements for 'F' markings must be observed.
7. Identify clearly the NEW Un-switched supply.
8. Ensure the LED Charge Indicator is clearly visible.

Warning

Avoid running the LED mains driver and Emergency Pack without the load connected. Failure to do so may result in damage to the LED array

Typical Conversion Wiring Diagram



Dali Operation

The NDA is pre-programmed with a standard test program consisting of 3 hour commissioning test, weekly thirty second functional tests, and annual 3 hour duration tests. These tests will check the lamp and battery operation and test results will be reported back via the indicator Led and the DALI network where available. When connected to the DALI system it will be possible to schedule and amend these tests as required.

The NDA is a Non-maintained DALI Device (it operates the lamp only in emergency mode) and will respond to normal DALI commands via the Da Da connections. These connections are not polarity conscious

Charge Indicator LED Indication

The bi-colour charge Indicator LED will show the NDA operational mode as follows.

Mode	Charge LED Indicator
Mains On – Battery charging No Faults	Green (Permanently On)
Mains On - Function or Duration Test	Green Flash (once every two seconds)
Mains On - Battery Fault	Red (Flash once every four seconds)
Mains On – LED Lamp Fault	Red (Flash twice every four seconds)
Mains On - Battery and Led Lamp Faults	Red (Flash 3 times every four seconds)
Mains Failure - Battery OK	Off

The NDA is designed for a bicolour charge indicator LED, which is a red and green LED connected back to back. Alternatively two high bright LEDs can be used instead. The Red terminal is the positive of the Red LED and the white terminal the positive of the Green LED.

Commissioning Test

The NDA will perform a three hour duration commissioning test 30 hours after the mains and battery are both connected, as long as the mains has been uninterrupted for 24 hours. This test will check LED lamp operation and battery capacity. The results of this test will be signalled via the DALI network and the Charge Indicator LED.

Function Test

The NDA will perform a thirty second functional test every week. This test will check LED lamp operation. The results of this test will be signalled via the DALI network and the Charge Indicator LED. A test can also be started manually at any time via the DALI network. If the NDA is not in normal operation, it will place the test into a state of Pending until it is possible for the test to start.

Duration Test

The NDA will perform a three hour duration annually. This test will check LED lamp operation and battery capacity. The results of this test will be signalled via the Dali network and the Charge Indicator LED. A test can also be started manually at any time via the Dali network. If the battery is not fully charged or the NDA is not in normal operation, the NDA will place the test into a state of Pending until it is possible for the test to start.

Stop Test

If the NDA receives the Stop Test Command then it will return to normal operation from a duration or functional test and remove any test from a state of pending.

Prolong Time

The NDA can be programmed to remain in emergency for a set time once the mains supply has been restored. This can act as a run on timer whilst discharge lighting etc. is warming up. The NDA is sent out with a default value of 0 (no Prolong).

Rest Mode

If the NDA receives a Rest command when in the emergency state then the lamp will be turned off and the NDA goes into rest mode.

Inhibit

If the NDA receives the inhibit command then it will not go into emergency mode during the fifteen minute inhibit period. In the event of a mains failure during this period the NDA goes into Rest Mode.

Relight/Reset Inhibit (Stop Inhibit)

If the NDA receives the Re-light command when in rest mode then it will return to emergency mode.

System Reset

The NDA can be reset via Command 32 (RESET) over the Dali network and Function test and Duration test results can be reset via independent reset commands and are not reset by Command 32. The lamp timers are also reset via an independent reset command and not by Command 32.

Fault Resolution

If the unit indicates an LED lamp fault then the LED lamp will need investigation/replacement. When the lamp is connected and operating correctly, it is possible to clear the lamp fault in two ways. Firstly a function test can be triggered via the Dali network, and secondly, if the un-switched mains is failed for 30s this will also clear the lamp fault. If the unit indicates a battery fault then the battery should be investigated/ replaced. If the battery had become disconnected the fault should clear when the battery is reconnected. If the battery fault is because the NDA could not complete a full duration test the battery will need replacing. Replacing the battery will automatically reset the battery charge stat to 0%, and re-initialise the test commissioning test, it however will not clear the battery fault until a full and successful duration test has been completed.

Testing/Commissioning

- Ensure the Load is connected.
- Connect the battery.
- Switch on the Unswitched Supply - Check the Charge LED illuminates.
- Switch on the Maintained Supply - Check the LED illuminates as normal.
- Switch off the Maintained Supply.
- Switch off the Unswitched Supply - Check the Charge LED extinguishes and the load LED illuminates at a reduced output.
- Enter the commissioning date on the Battery Pack. Switch on the Unswitched Supply

Luminaire Ref/Location _____			In Case of difficulty, contact the Installation Engineers:- Tel: _____							
Full Recharge Time 24 Hours			Duration 3 Hours				Lamp Type - LED			
ROUTINE TEST RECORD										
	Year 1		Year 2		Year 3		Year 4		Year 5	
Monthly Test	Signed	Date	Signed	Date	Signed	Date	Signed	Date	Signed	Date
Functional										
Functional										
Functional										
Functional										
Functional										
Functional										
Functional										
Functional										
Functional										
Functional										
Three Hour										