AIRFIELD LIGHTING
SYSTEMS UK LTD

Instruction Manual
LED Retrofit Kit
for Airfield Signs V1.1

Documentation

This document includes information on our Airfield Lighting Product with a focus on safety, installation and maintenance procedures. It is very important to read this document before any work is started.

Copyright

History

Version	Date	Description	Reference
1.0	August 2021	First Edition	DJ
1.1	October 2021	Updated Edition	AK

Note: This page is to be updated with every authorised change to the document.

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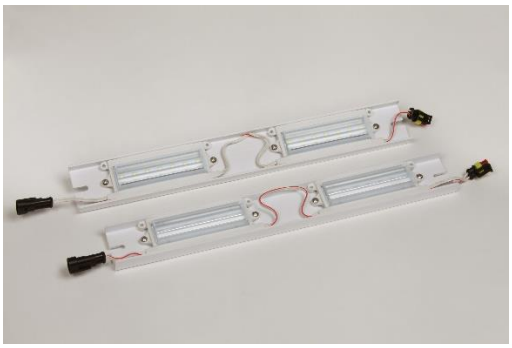
1. INTRODUCTION

This manual covers the ALS Retrofit Kits for Airfield Lighting Signs. There are two main parts that are required the ALS20 power convertor and LEDs that are supplied in two module options (2 or 3 LEDs).

Part Code	Description
ALS20	Power Convertor
EL2-420	2 x LED modules 420mm length and cable
EL3-630	3 x LED module 630mm length and cable

ALS20 Power Module



EL2/3 LED Module

The ALS LED retrofit kit replaces older light sources such as halogen or fluorescent light sources in Airfield Signs. Cabinets can be upgraded on site to the latest low power LED technology.

ALS has developed a system to retrofit cabinets with older light sources with our new Edge Lit LEDs to give improved power consumption and uniformity of light across the sign face. These kits can be easily installed into existing signs on site.

The ALS retrofit kits can be installed into cabinets with a depth greater than 150 mm. Additionally, they can operate a sign with length of 4.5m supplied from just one power supply. As an option they can also use mains 240V power supply.

The LEDs are supplied on standard mounting plates suitable for installing the LEDs into ADB, ALS, ASM, ATG and SMITHS signs as well as other sizes available. We can always customize a plate for other signs please ask for further details.

Main Features:

- Highly visible in all operational conditions
- Low power consumption with LED light source
- Average power factor of 0.89
- Excellent uniformity of light across the whole sign face
- Minimal maintenance required (50,000 hours life of the LED module)
- Long term cost savings
- Temperature range of -40°C to +60°C

Electrical Data:

- 6.6 Amp constant current circuit input (4-7 brilliancy steps or non-dimming)
- 120 – 240V 50 Hz input option
- 12VDC input option (for use on solar powered signs)
- LEDs life expectancy 50,000+ hours
- The maximum number of LED modules for the ALS20 unit is 19 modules.

2. SAFETY

Please make sure you read this section and are familiar with safety precautions before any work is started.

2.1. Icons used in the manual

Carefully read and observe all safety instructions in this manual, which alert you to safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

WARNING
Failure to observe a warning may result in personal injury, death or equipment damage.

	**Danger** - Risk of electrical shock or ARC FLASH. Disconnect equipment from the line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death.
	**CAUTION** Failure to observe a caution may result in equipment damage.

2.2. Safety Instructions

a) Please carefully read and observe all safety related warnings throughout this manual. Failure to do so could result in serious injury, death or damage to equipment.

b) Please observe any local site and regional safety requirements before commencing work on any part of an AGL Circuit.

c) Isolate the electrical supply to the ALS Illuminated Sign before commencing any work.

d) Work to the sign must only be carried out by qualified and competent persons, to be deemed so by the aerodrome or authorising person.

e) ALS LED Illuminated Signs are heavy, and manual handling of any kind is not recommended.

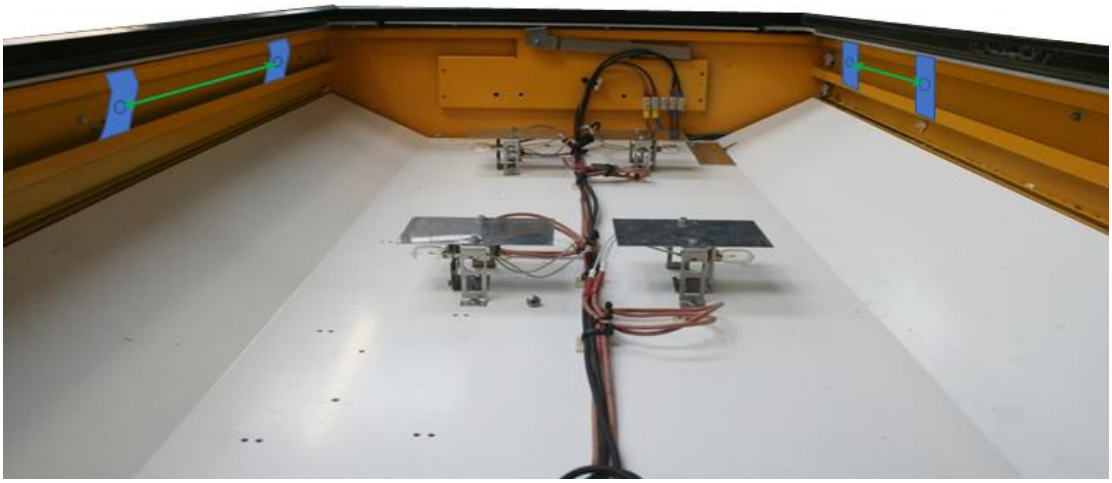
Prior to installation, ALS LED Illuminated Signs must be protected from the elements, failure to do so could result in damage to the equipment.

3. DESCRIPTION OF THE LED MODULE

We utilize a high-quality LED strip module providing 7100K Colour Temperature.
It Installs easily around the edge of signs and our LED system delivers significant cost-saving advantages over T8 fluorescent tubes.

Features & Benefits

- OptiLens™ technology creates an impressively even light coverage of the sign face
- Over molded design protects components from damage
- Continuous wire and IDC connectors for maximum strain relief
- Works in single and double-sided box signs
- Up to 78% energy savings vs. T8 fluorescent tubes
- Easy to install system
- Highly visible in all operational conditions
- Low power consumption
- Average power factor of .89
- Excellent uniformity of light
- Minimal maintenance required
- Long term cost savings
- Temperature range of -40°C to +60°C



LED Modules positioning in cabinet

Switching from Fluorescent tubes to the latest LED technology, gives good brightness and exceptional uniformity along with impressive energy savings. The superior efficiency produces energy savings up to an incredible 78%. This gives a great saving in energy consumption over the long life of the system.

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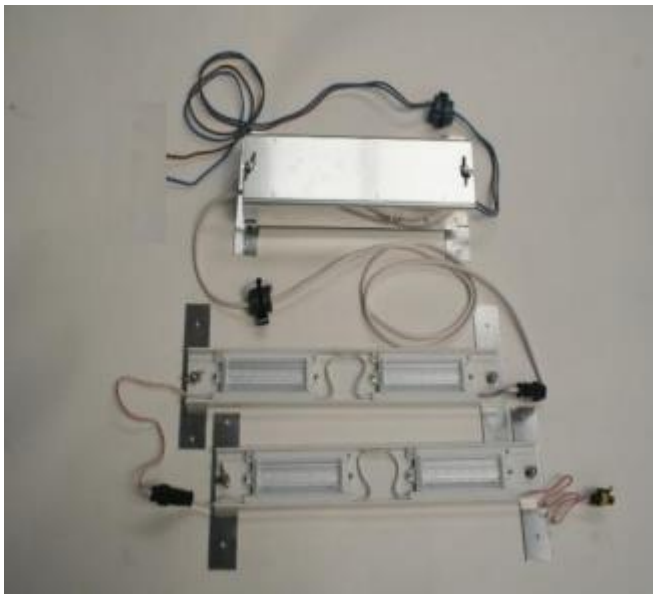
3.1.1. Retrofit Kit Structure



3.2. LED Loading table

No LED Modules	Power (Watts)	Power Supply Rating
2	32	45W
3	38	45W
4	43	45W
5	48	65W
6	54	65W
7	59	65W
8	65	100W
9	70	100W
10	75	100W
11	81	100W
12	88	100W
13	94	150W
14	99	150W
15	104	150W
16	110	150W
17	115	200W
18	121	200W
19	126	200W

3.3. Illumination of Sign Face Intensity Table

Legend Size	Height of Face	Red	Yellow	White
400mm	800mm	30[1] 10[2]	150[1] 50[2]	300[1] 100[2]
300mm	600mm	30[1] 10[2]	150[1] 50[2]	300[1] 100[2]

Notes

1. Minimum values required by ICAO specs for operation in RVR less than 800m
2. Minimum values required by ICAO specs for operation in RVR of 800m or greater.

4. INSTALLATION

The LEDs are best installed centrally on the inside top edge of the cabinet for standard rectangular cabinets and the power supply is mounted on stand offs from the bottom of the cabinet.

Light is reflected inside the cabinet to give a uniform light output over the whole face.

To aid in this we recommend the inside of the cabinet is white. Large amounts of dirty or dark coloured areas will stop the correct light output being achieved on the face. It is also beneficial to clean both the inside and outside faces.

To install the kit please remove all old lamps and fixings also any brackets or struts that would obstruct the LED channels or cast a shadow from them onto the face. Making sure to keep the input wire and terminal block.

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Evenly space the LED channels along the top of the sign with not more than 300mm between each one.

The distances to install the LED plates are: EL3-630, 605mm spacing between center of the plates and for EL2-420, 395mm spacing between center of the plates.

The ALS20 power convertor should be mounted at bottom of sign with 300mm spacing between center of the plates. The ALS20 is connected to the existing input with the blue and brown cables wrapped round a ferrite core. The output to the LEDs is a blue and brown cable with a ferrite. This connects to the LEDs with easy-to-use push fit waterproof (IP67) connectors.

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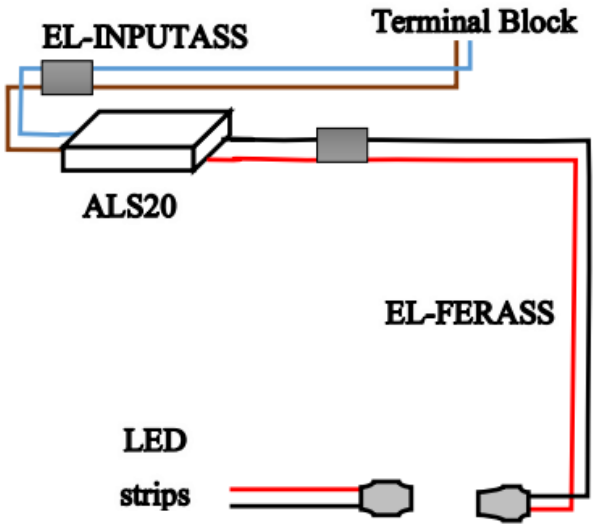
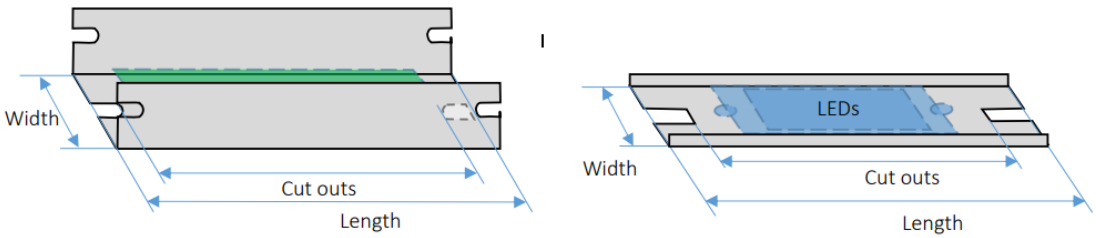
4.1. Wiring Diagram



4.2. Mounting Plates Diagram for LED modules



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4.3 ALS20 Power Convertor

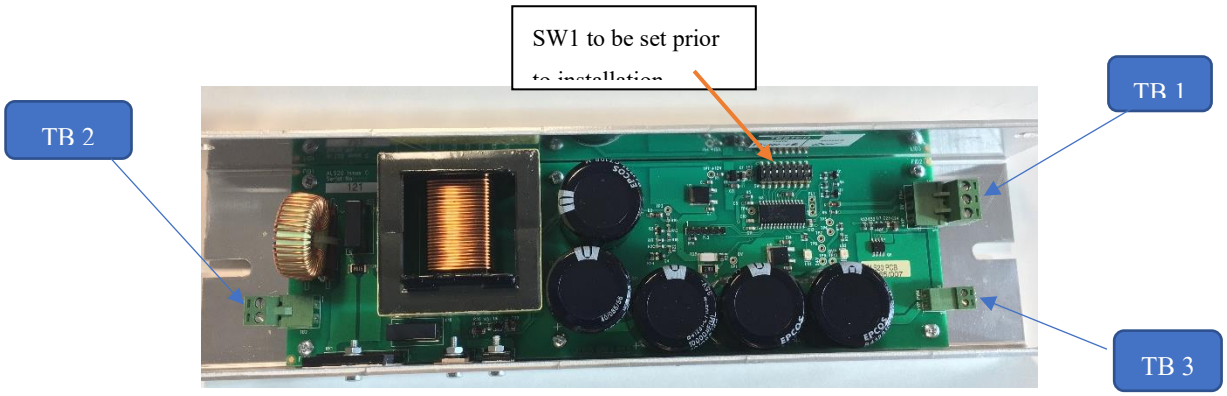
The ALS20 is an LED driver developed to drive the ALS range of LED Taxiway Signs that run off of the AGL circuits (6.6Amps). It supersedes the PCA-S-001A Power convertor that was originally developed to drive the Back lit LED's on Aluminum Strips, See Fig 1.

Fig 1. Back Lit LED Version.

Fig 2. Edge Lit LED Version.

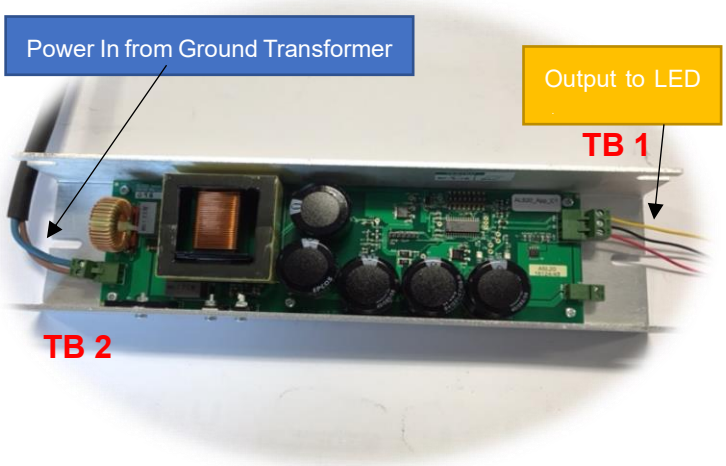
The ALS20 can be configured to drive either or versions of the ALS Taxiway signs, the Input stays the same via TB2, the Output from the ALS20 would be via TB1, three output terminal block to drive the Back lit LED version or TB3, two output terminal block to drive the Edge Lit LED version.

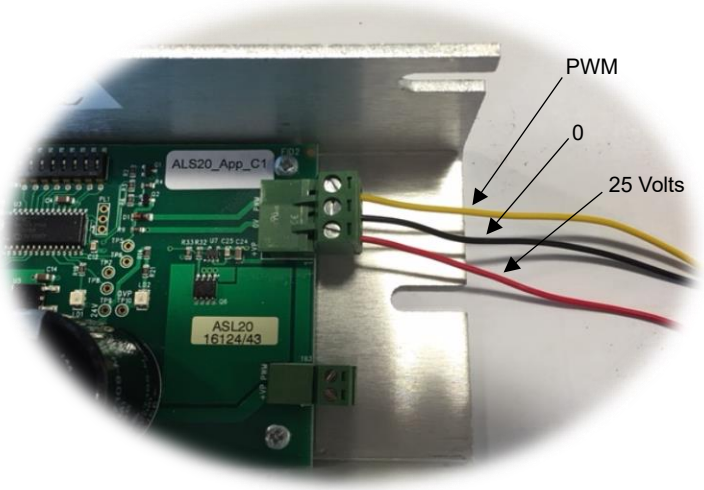
Note. The ALS20 has to be configured before installation to the version of LED that it will be driving.

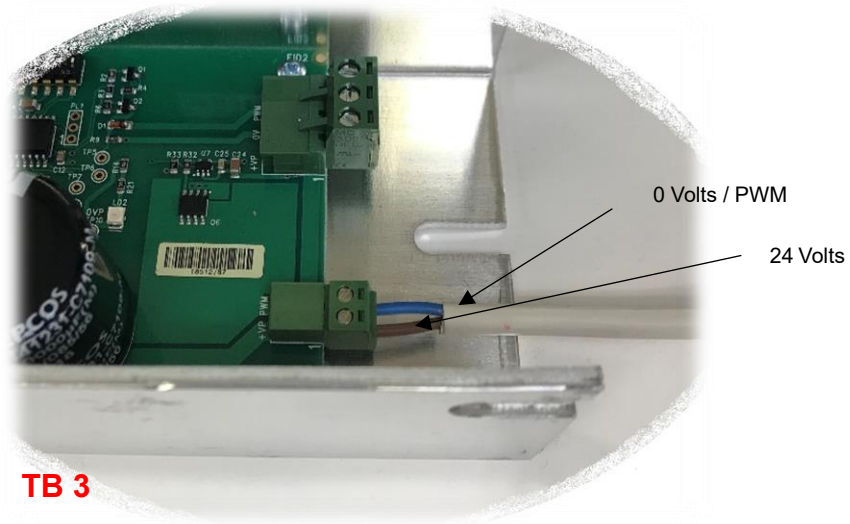


To replace the PCA-S-001A Power convertor: (TB1)

N.B. Make sure all output wires are wired in, even if they weren't







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To replace the ALS20 Power convertor: (TB3)

Switch Settings For LED Version.

- Switch 7 – LED mode selection

SW7 = off
This is for the original ALS back lit LED strips. The LED strip must be connected to TB1.

+27V is outputted continuously on Pins 1 and Pin 2 is 0V, and Pin 3 is the PWM signal for controlling the LED brightness.

SW7 = on
This is for the New ALS edge lit LED blocks. The LED block must be connected to TB3.

+24V is outputted continuously on TB3 pin 1 and the LED brightness is controlled by PWM

On Pin 2 0V.

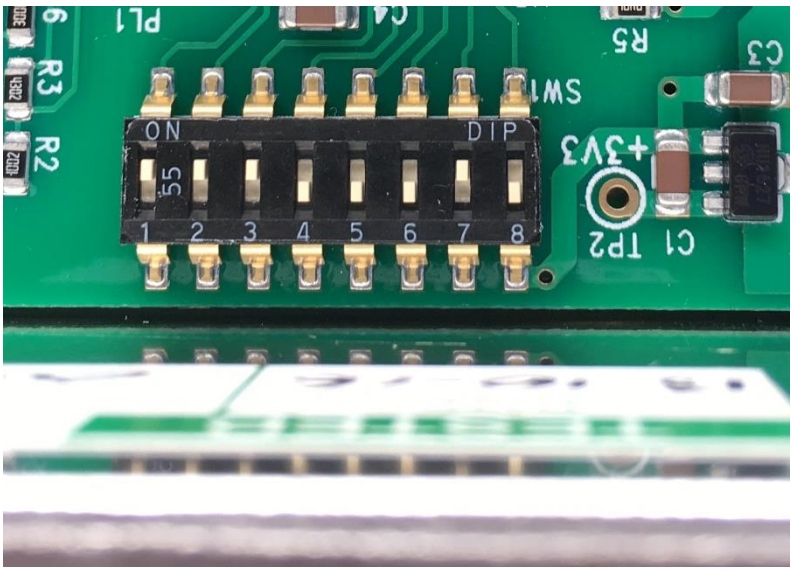

Fig 3.

As shown in Fig 3. Above the 8 Way Dip Switch SW1. Switch Position number 7 is in the ON position, therefore this ALS20 is set for the Edge lit LED version of sign.

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Switches 1 to 3 are used to select different Dimming Profiles as indicated in the table below:

Switch number			Curve selected
1	2	3	
Off	Off	Off	CAP168 4 brilliancy's steps
On	Off	Off	CAP168 7 brilliancy's steps
Off	On	Off	FAA 5 Step
On	On	Off	FAA 3 Step
Off	Off	On	MAD'S NVG
On	Off	On	TSR
Off	On	On	ICAO 4 brilliancy's steps
On	On	On	Diagnostic, test purposes only

1.1. Tools and Installation materials required

Choosing right tools not only can ensure the correct and reliable installation of the lighting fixtures, but also can reduce unnecessary safety accidents. Please pay attention during procurement.

The LED retrofit Kit is supplied from these components:

Product Code	Description
ALS20	LED Sign Power Convertor MK 2
EL-FERASS	Output Ferrite assembly for power convertor
EL-INPUTASS	Input Ferrite assembly power converter
EL2-420	Edge Lit LED assembly 2 blocks 420mm
EL3-630	Edge Lit LED assembly 3 blocks 630mm
Various	LED Mounting plates with fixings
Various	ALS20 Mounting plates with spacers and fixings
Various	Mounting rivets or screws available on request

1.2. Troubleshooting

Issue	Solution
Row of modules does not light	• Check wire connections to power supply to ensure red stripe-to-red and white-to-black or blue connections • Check row-to-row polarity connections
Sign does not light	• Check input and output voltage and check power supply input/output connections. • Check polarity connections. • Ensure the overall length of the Tetra® LED System does not exceed the maximum load.
Individual modules do not light	• Remove module and replace with another working module
Modules are dim	• Ensure the overall length of the Tetra® LED system does not exceed the maximum load • Ensure the length and gauge of the supply wire is equal to or below the recommended remote mounting distance

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