

# AL23 Dual Function Electric Spark-arc and Constant Automatic Lighting module

## CAUTION - REMOVE THE BATTERY BEFORE PLUGGING IN OR REMOVING AN LED

This Automatic Lighting controller is designed to fit inside models and detect small amounts of movement and control 2 lighting effects produced by small LED lights. Please read these instructions before using this product.

### Contents

- AL23 Spark-Arc + Constant Lighting
- 1 Small White LED for Spark effect
- 1 Cold White LED for interior lighting
- BAT1 CR2032 lithium button battery

### Introduction

The AL23 is fitted inside a loco or multiple unit and when it detects motion randomly flashes a bright white LED mounted underneath or on top of the loco to simulate the sparks and arcs from 3rd rail or overhead electric trains. This module also has a constant light output for lighting a passenger coach, cab, etc. Other modules have a flashing tail light (as on modern trains), flickering lantern / firebox effect (which flicker more as the train goes over bumpy track!), door open amber lights or constant output for lighting coaches, headlights, head codes etc.

### How it works

A low power microprocessor constantly monitors a tiny sensor which can detect small amounts of motion. When movement is detected it switches on lighting effect until no motion is sensed for 4 minutes, then turns off the effects to save power.

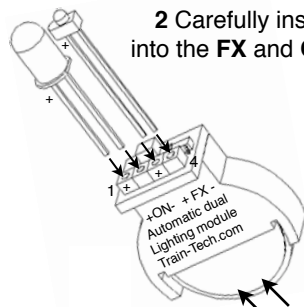
### Testing the AL module

Before fitting we suggest you test the AL by plugging in the LEDs supplied to see how it operates & decide on the best locations etc in your model.

This dual function module has an **FX** output for the effect LED and an **ON** output for constantly on LED(s).

1 Trim longest LED pin to same length as other pin

2 Carefully insert LEDs into the **FX** and **ON** sockets



3 Slide in Battery + to +

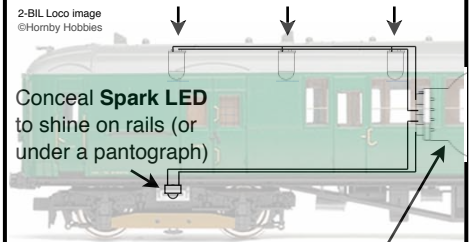
As soon as you fit the battery the LEDs should light because you are moving the module - if they do not light try fitting the LED the other way. Place the module on a completely still surface & just over 4 minutes after the last motion the LED should switch off.

### Fitting the module inside a model

AL modules are easy to fit and we offer the following suggestions:

#### Interior Lighting

The constant ON output can be used with one LED to light a loco cab, headcode or destination sign or can be used to light a whole a coach or multiple unit using several low power LEDs connected in parallel. (Train-Tech offers sets of special low power warm and cold white LEDs for AL modules) **Tip** - roughen the lens of LEDs using a file or emery paper to spread light more evenly.



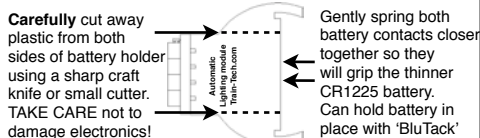
Hide AL module in end or in base of coach, carefully sliding LED wires into sockets and holding it in place with foam or 'BluTack' etc

#### Care

- Fit battery polarity correctly, + to +
- Careful not to damage parts on PCB
- Never apply more than 3 volts
- Never short circuit battery terminals
- Dispose of used battery's properly

### Fitting AL module in N gauge models

If you wish to fit the module into a smaller gauge than OO/HO you will either need to use large rolling stock such as a container wagon or coach, or use a smaller battery. We suggest the following modification for fitting the module into an N gauge wagon or coach, however please read the warning below before modifying anything. The CR1225 is a lithium 3 volt battery which is much smaller than the 2032 with a 12mm diameter. The electronics module is also 12mm wide and this will just fit into many N gauge wagons or coaches, but the battery holder will need to be trimmed:



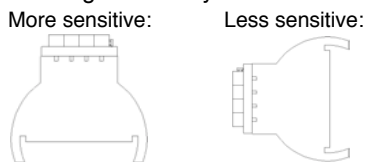
Observe polarity when fitting battery + to +  
The small CR1225 will not last as long & is not recommended for our dual function AL2x modules. It is available as BAT2 from [www.dcpexpress.com](http://www.dcpexpress.com) & dealers.

### Warning

Please note any modification of the module will invalidate the warranty and should only be attempted by a confident modeller. Modelling suggestions are offered in good faith but anything you modify is at your own risk and Train-Tech/DCP cannot be held responsible for any injury, damage or loss however caused.

### Adjusting sensitivity

You can adjust sensitivity of the motion sensing by positioning the AL module at different angles inside your model:

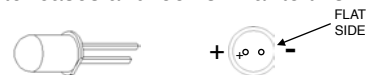


### Using other LEDs

One of the reasons the small battery can last so long is because the LEDs supplied have been specially selected for their low voltage and power. It is safe to experiment with other types of LED, but bear in mind they must be able to operate on very low currents & voltages - if connecting several LEDs together only use the same types. LED stands for *Light Emitting Diode* and a diode is an electronic component which only works electrically in one direction, so always need to be fitted the correct way round to work correctly and last. Most standard miniature LEDs which a modeller will use must only have a maximum voltage of 2 to 3 volts applied, so current flowing through the LED needs to be reduced and this is usually done by a resistor in series (in between), typically 1000 ohms for a 12 V supply. However to make wiring easier this AL module and most Train-Tech LFX and Signal LED controllers already have resistors built in so that LEDs can connect directly to the module without resistors.

### LED connections

As explained previously most LEDs have a polarity and must be connected the correct way round to light. The most popular LEDs come in 3mm and 5mm diameter cases and look similar to this:



The best indication of polarity on this type of LED is to find the flat side on the round base. This side usually indicates the negative (Cathode) connection and the other wire the positive (Anode) connection to power.

Another very small LED we supply for some Train-Tech products looks like this:



There are many LEDs on the market and it is good to experiment, but check manufacturers data for specific connection information as there are no real standards. Remember to always use a resistor in series with the LED when using it on a standard DC power supply or battery.

Train-Tech offers packs of LEDs for modellers including sets of low power warm white (LED11), cold white (LED12) and mixed (LED13) LEDs for AL modules. Small tools, batteries, switches and wire are also available from Train-Tech.

## One-Touch DCC™ Digital Signals

DCC WIRE FREE OO HO

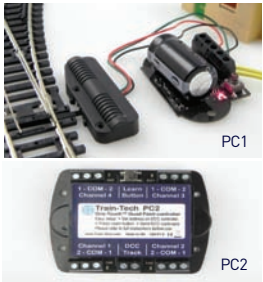


- Signal with DCC decoder built into base
  - Can just plug direct into track – no wires!
  - Easy to fit and use – no CV programming!
  - Can sync to other signals & points
- DS1 Home:** Red (R) and Green (G)  
**DS2 Distant:** Yellow (Y) and Green (G)  
**DS3 Home Distant:** (R) (Y) (G)  
**DS4 Distant:** (Y) (G) (Y)  
**DS5 Outer Distant:** (R) (Y) (G) (Y)  
**DS5HS Outer Dist:** (R) (Y) (G) (Y) (High Speed mainline)  
**DS6 Dual Head Home:** (R) (G)  
**DS7 Dual Head Distant:** (Y) (G)  
**DS8 Stop-Caution:** Red (R) and Yellow (Y)

Track not included

## One-Touch DCC™ Point Controllers

DCC OO HO N Z



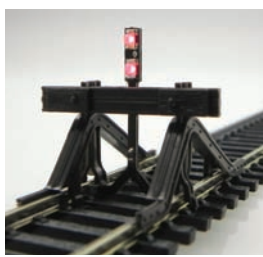
- Control points and uncouplers using DCC
- Easy to use – No CV programming!
- Work with most solenoid point motors
- Just connect 2 wires to nearby DCC rails
- Easy screw terminals – no soldering
- Built in CDU for efficient operation
- Can sync to other points and signals

**One-Touch DCC™ Point controllers**  
**PC1 DCC Single Point Controller**  
**PC2 DCC Quad Points Controller**

Point motor and track not included

## Buffer Lights

DC DCC WIRE FREE N OO HO



- Add realistic stop light to any siding
- Simply clips onto track – No wires!
- Fits next to most buffer stops & kits
- Or at platform end or free standing
- Low cost, easy to fit and use
- On DCC both lights are on constantly
- On DC one light is on & varies with speed
- Helps bring your layout to life!

**BL1 OO/HO gauge Buffer Light**  
**BL2 N gauge Buffer Light**

Track and buffer stop not included

## Automatic Tail, Firebox, Loco & Coach Lights

Auto WIRE FREE ANY GAUGE



- No switch – senses motion & turns on!
- Turns off automatically 4 minutes after stop
- No pickup, wires or soldering – LED plugs in
- Fit in brake vans, coaches, loco, wagons etc
- Runs for ages on small button battery

**Single output modules:** **Dual output modules:**  
**AL1 Flashing Tail light** **AL21 Flashing + constant**  
**AL2 Flame Tail / Firebox** **AL22 Flame + constant**  
**AL3 Constant lighting** **AL23 Sparkarc + constant**  
**LEDs & battery included** **AL24 Doors open + constant**

## LFX Lighting Effect Controllers

DC DCC ANY GAUGE



LFX1 shown with supplied LEDs fitted to a Peco barrier kit - not included

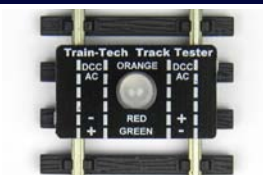
**LFX1 Level Crossing Barrier**  
 Controls Amber and Red LED's as seen at level crossings. Can power up to 4 sets of steady amber and flashing red LEDs

- Add lighting effects to your layout
- LEDs screw in – no resistors or soldering
- Powered by either 12-16V DC or DCC:
- On DC the effect is on when powered
- On DCC the effect can be controlled

**LFX2 Home & Shop Lighting**  
 Randomly controls lights in houses, shops, stations, pubs  
**LFX3 Traffic Lights**  
 Controls one pair of timed traffic lights [Tip: You can adapt one of our Signal kits to make traffic lights]  
**LFX4 Log or Camp Fires**  
 Controls amber, yellow, red LEDs for a realistic fire effect  
**LFX5 Welding effects**  
 Realistic electric arc welding effects with bright LEDs  
**LFX6 Quad LED Lighting Controller**  
 Controls 4 sets of LEDs on and off using separate DCC addresses. Directly powers 4 LEDs per output (DCC only)

## Track Tester

DC DCC N OO HO



- Quickly tests track for power faults
- Low cost and easy to use
- Works on N, TT, OO or HO Track
- Indicates the DC polarity, or DCC, or a fault
- Small enough to check point frogs

**TT1 Track Tester**

## One-Touch DCC™ Signal Controllers

DCC ANY GAUGE



- Control LED & Semaphore signals by DCC
- Easy to set up & use – No CV programming!
- Easy screw terminals – no soldering
- Can sync to other points & signals

**SC1 Dual 2 aspect colour light signals controller**  
 Controls one or two 2 aspect colour light signals. Compatible with Train-Tech SK2, SK3, SK7, SK8 and most other manufacturer's LED signals



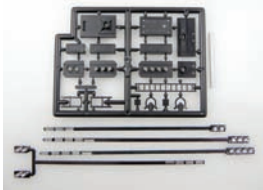
**SC2 3 or 4 aspect or 2 aspect+route signal control**  
 Controls one 3 aspect or one 4 aspect or one 2 aspect + route signal. Compatible with Train-Tech SK4, SK5, SK6 and most other manufacturer's LED signals

**SC3 Dual Dapol OO/N Semaphore signal controller**  
 Controls one or two standard OO or N Dapol motorised semaphore signals by DCC. Signals connect direct to the SC3 – no modifications or power supply needed.

Dapol Signals for photo - not included

## Self Assembly Colour Light Signal Kits

DC DCC OO HO



- Every kit includes the head, post and base plus detailing kit inc ladder, handrails, etc
- Aluminium 'post' included with each kit
- Low cost – adapt to your own design
- Control by switches or a signal controller

**General purpose signal kit:**

**SK1 Basic kit 2/3/4 aspect & dual heads - no LEDs**

**Signal kits with LEDs and resistors**

**SK2 Home 2 aspect kit with Red (R) Green (G) LEDs**

**SK3 Distant 2 aspect kit with (Y) (G) LEDs**

**SK4 Home Distant 3 aspect kit with (R) (Y) (G) LEDs**

**SK5 Distant 3 aspect kit with (Y) (G) (Y) LEDs**

**SK6 Outer Distant 4 aspect with (R) (Y) (G) (Y) LEDs**

**SK7 Dual head Home 2 aspect with (R) (G) LEDs**

**SK8 Dual head Distant 2 aspect with (Y) (G) LEDs**

The LEDs are pre-fitted onto a long narrow PCB stick to pass through your baseboard. Just attach your signal control wires to PCB

SEE WWW.TRAIN-TECH.COM OR CONTACT DCP FOR FREE COLOUR BROCHURE

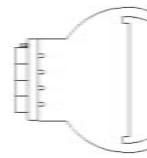


# Train-Tech

Model Technology Made Easy

## AL23 Automatic Dual Lighting set Spark effects & Interior Lighting

- Detects movement and turns on automatically!
- Fits inside Electric Loco or EMU Multiple Unit
- No pickups, wires or soldering – LEDs plug in
- Runs for ages on standard button battery
- Ready to go – just fit module & LEDs inside model
- Spark Effect LED, White LED & battery included



[www.Train-Tech.com](http://www.Train-Tech.com)

See our website, your local model shop or contact us for a free colour brochure  
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