

# ModelSigns Model Railway Lighting - Wiring Starter Kit

Applies to MS-WSK-Basic, MS-WSK-Full and all MS-WSK-SPARE-\*\*\* SKUs

Kit Contents-

## MS-WSK Basic

- 1x 12v 2a Power Supply/Transformer with UK plug
- 1x Terminal Block to Barrel Plug Connector
- 30x Crimp Blade Splice Connectors
- 30x Male Tab Connectors
- 5m Black 2mm Multistrand Wire
- 5m Red 2mm Multistrand Wire
- 3m Black 1mm Multistrand Wire
- 3m Red 1mm Multistrand Wire
- 20x 1k ohm 1/2w Resistors
- 5x 20cm Black Heat Shrink Tubing

## MS-WSK Full

- 1x 12v 2a Power Supply/Transformer with UK plug
- 1x Terminal Block to Barrel Plug Connector
- 30x Crimp Blade Splice Connectors
- 30x Male Tab Connectors
- 5m Black 2mm Multistrand Wire
- 5m Red 2mm Multistrand Wire
- 3m Black 1mm Multistrand Wire
- 3m Red 1mm Multistrand Wire
- 20x 1k ohm 1/2w Resistors
- 5x 20cm Black Heat Shrink Tubing
- 1x Wire Stripping/Crimping Tool

**INSTALLATION GUIDE ON FOLLOWING PAGES >**

## Safety Notes

- **This product is not a toy. It is not recommended for use by children under the age of 14. Keep away from small children as the product contains small parts which can present a choking hazard.**
- This product is for indoor use only.
- The instructions in this manual are designed to act as a suggestion only, please ensure you follow the correct safety procedure for any equipment or materials used. We are not responsible for any damage caused to the product, your property or yourself as a result of a improper handling or usage.
- As with any electrical installation we advise seeking the expertise of a qualified electrician before use.
- Before use, be sure to check that the transformer is correctly rated for your electricity supply. Never attempt to modify or open the power supply/transformer. The transformer should be examined regularly for damage to the casing, plug pins and cables.
- In the event of damage to any part of the lighting circuit or transformer do not turn the kit on, instead fix any damage to the layout wiring or replace the transformer. Again, never attempt to fix or open the power supply/transformer.
- Always disconnect the power supply before carrying out any work or modification to the lighting circuit.
- Please note, some model railway accessories may hold a charge even after the supply is turned off, be sure to discharge the circuit before coming into contact with the circuit.
- The kit must never be connected more than one power supply. The output of the transformer must not be connected directly, or indirectly, to the output of any other AC or DC circuit derived from a transformer or mains supply.
- Do not exceed the maximum rated output of the transformer supplied or the ratings of other parts of the kit. DO NOT use any part of this kit with voltages higher than 12v (other than the connection of the transformer to a wall plug).
- Do not install or use near gas installations, electric heaters, fireplaces, candles or other similar sources of heat.
- Disconnect the product from power whenever you leave the kit unattended, this reduces the fire risk and also prolongs the life of any accessories connected.
- Do not hang ornaments or any other objects from the wiring and do not cover any part of the kit with cloth, paper or any material that is not part of the kit.
- We cannot guarantee the performance of third party accessories connected to this system, please ensure the relevant current or voltage limiting devices are used.
- If in doubt over any element of this kit, its installation or its operation, please seek the expertise of a qualified electrician.

This manual may not be copied, duplicated, amended or circulated in any form without written permission from ModelSigns

## About the kit

Your new ModelSigns Model Railway Lighting Wiring Starter Kit is designed to make the process of installing and powering lights and other accessories on your layout easier than ever! This kit contains nearly everything you'll need to install at least 10 sets of lights to your layout (additional consumable parts can be purchased directly from the ModelSigns store for adding more). When using ModelSigns Premium lights the entire solution is solder free, or for non-premium ModelSigns lights, simply use the supplied resistors and heat shrink. While this guide will specifically give the instructions for wiring ModelSigns accessories, lights and accessories from other manufacturers can also be used, but please take care to check the operating power requirements and make sure these will not exceed the maximum supply capability of the power supply.

## Parts



- A - 20x 1k ohm 1/2w Resistors
- B - 1x Terminal Block to Barrel Plug Connector
- C - 5x 20cm Black Heat Shrink Tubing
- D - 1x Wire Stripping/Crimping Tool\*
- E - 30x Crimp Blade Splice Connectors
- F - 30x Male Tab Connectors
- G - 1x 12v 2a Power Supply/Transformer with UK plug
- H - 5m Black 2mm Multistrand Wire
- I - 5m Red 2mm Multistrand Wire
- J - 3m Black 1mm Multistrand Wire
- K - 3m Red 1mm Multistrand Wire

\* - Not included in basic kit

**CONTINUED ON NEXT PAGE >**

This manual may not be copied, duplicated, amended or circulated in any form without written permission from ModelSigns

## Extra Tools/Materials

While this kit includes all of the materials you should need to wire your lights, you may need a few extra items depending on how you intend to install the kit and the construction of your layout. These are -

**Pliers – Required**

**Drill (with various drill bits) – Required**

**Screwdriver (with No. 1 Cross Head) - Required**

**Crimping Tool – Required (Included in Full kit)**

**Wire Striping Tool – Required (Included in Full kit)**

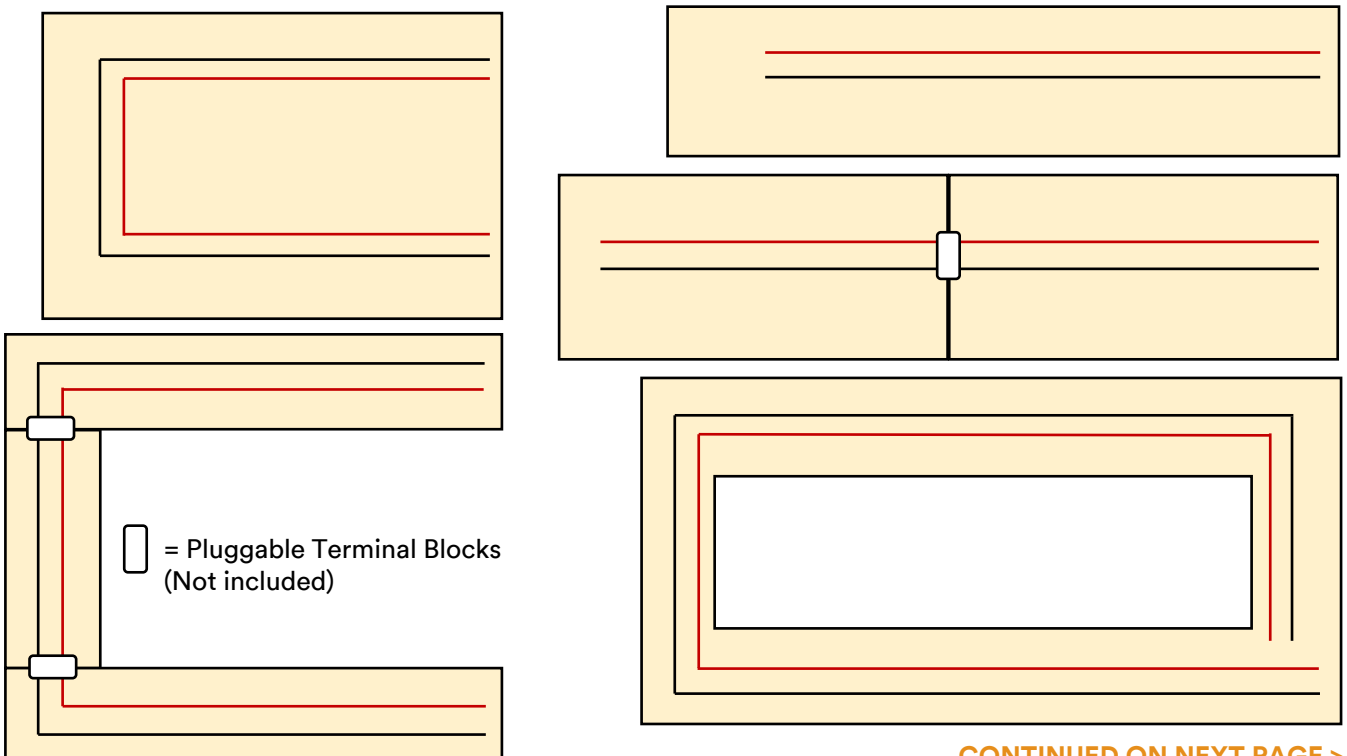
**Cable Clip – Optional (Depends on baseboard construction)**

**Adhesive Cable Clip - Optional (Depends on baseboard construction)**

**Pluggable Terminal Blocks – Optional (Required for multi-board layouts)**

## Step 1 – Running the bus wires

The ‘bus’ wires will be the main two wires [**Parts H & I**] that run the length of your layout and are used to power all of your lighting accessories. Depending on the dimensions of your layout these should be arranged in such a way that it is possible to reach them from any area where you wish to have lighting on the surface of the board without the need for exceptionally long wires from the lights themselves. On larger layouts, or those with many lights, it may be necessary to purchase additional lengths of wire, this is available from the ModelSigns store. While it is important to have the bus wires near to where lights will be installed, try to avoid placing them directly beneath to avoid drilling into the wires when installing lights. At this stage do not cut the ends of the bus wires, additional wire should be looped at the end and can be trimmed once installation is complete. See some examples below.

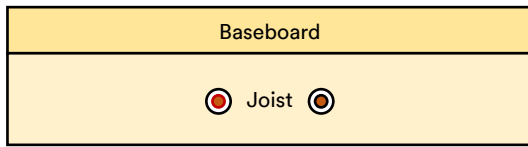


**CONTINUED ON NEXT PAGE >**

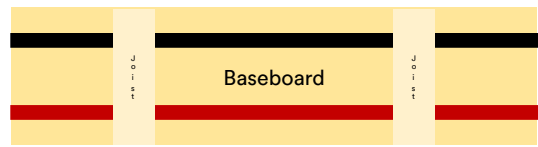
## Step 1 – Running the bus wires - Continued

Depending on the construction of your layout there are several different possible mounting options.

Option 1 – For layouts with horizontal joists supporting the baseboard simply drill 2x 3-4mm holes through each joist and feed the bus wires [Parts H & I] through these holes, allowing the wire to run around the underside of the layout. Take care to avoid any screws used to secure the board to the joist. This method should allow you to easily hang the wires underneath the layout without a need for any additional cable clips.



Side-on View

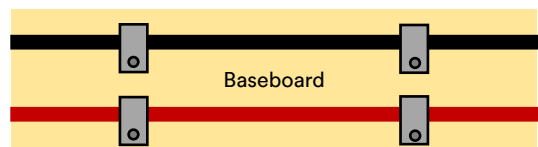


Underneath View

Option 2 – On layouts that have been constructed without horizontal joists, or on layouts where it is impractical to drill through the joists it is possible to use cable clips (not included) to suspend the wires from the baseboard. However, care should be taken to make sure that a) the pin on the clip doesn't pass through to the other side of the baseboard, b) the bus wires aren't damaged or compressed by the clip/pin and c) that the wires are held in place securely with little chance of them falling as this could present a safety issue.

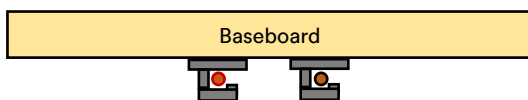


Side-on View

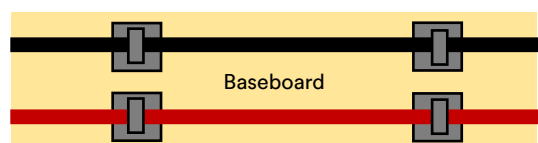


Underneath View

Option 3 – Like option 2, this should can be used on layouts without joists, it can also be used in addition to Option 1 to provide additional support for longer spans between joists. This option is primarily aimed at layouts where the baseboard is too thin to comfortably accommodate a cable clip with a pin, although do note that it is potentially less secure. In this situation is is possible to use adhesive cable clips (not included) as these don't require a pin to be hammered through the baseboard.



Side-on View



Underneath View

**CONTINUED ON NEXT PAGE >**

## Step 2 – Adding Lights

After fitting the bus wires the following step is to start to add your lights. When installing lights to your layout follow the instructions provided by the manufacturer. For ModelSigns lights these manuals can be found on the ModelSigns website under ‘Support’.

A condensed set of installation instructions for ModelSigns lights would generally be as follows-

- 1) Mark the intended location of each light on the baseboard from above. Make sure you will be able to drill through your baseboard in this location and that you’re not going to clash with a wire, a joist or point motor underneath the board.
- 2) Carefully drill through your baseboard in the marked positions. Be sure to drill a large enough hole for the resistor and wiring to fit through.
- 3) Prepare your lights for installation by-
  - i) For standard ModelSigns lights designed to operate on 3v, solder one of the supplied resistors **[Part A]** to the negative lead from the light and cover with a small length of heat shrink tubing **[Part C]** taking care to cover all exposed wire. Carefully use the side of the soldering iron to activate the heat shrink tubing. This step can be skipped for ModelSigns Premium lights as they are designed to operate directly from a 12v supply and generally already have resistors attached.
  - ii) Check to see if the wires attached to the light are long enough to reach the bus wires from their intended location without being strained, if not, use the 1mm wire **[Parts J & K]** to extend the wires so that there is a comfortable amount of slack to reach the bus wires (this can be trimmed later if too long). Again, use heat shrink **[Part C]** to cover any exposed wire to prevent short circuits. Standard wiring convention is to use black wire for the negative lead and red for the positive, try and stick to this to simplify the installation process

Customers with the Wire Stripping Tool **[Part D]** can use this to cut and strip the wires.

To cut the wire, place it inside the jaws of the tool next to the blade marked ‘WIRE CUTTER’, squeeze the handles and the wire will be cut.

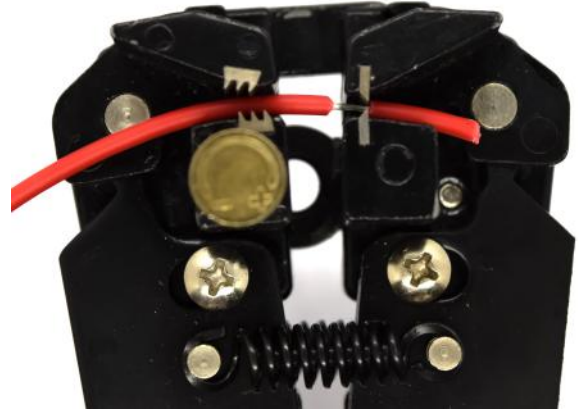


**CONTINUED ON NEXT PAGE >**

## Step 2 – Adding Lights - Continued

To strip the ends of the wire, place it inside the stripper head on the top of the tool as shown.

The right hand pincers mark the point at which the insulation will be trimmed. Squeeze the handles and the tool will remove the insulation.



- 4) Once you have added any required resistors or additional wire length you can continue to fix the light in position on the layout as per the manufacturers instructions.
- 5) Once the light is fixed in place and the wires fed through to the underside of the baseboard it is time to attach the Male Tab Connectors **[Part F]** to each of these 'droppers' (the wires that \*drop\* through from above the board).
  - i) First, prepare the end of the wire for insertion into the connector. If you haven't already, strip a small amount of wire insulation from the wire ( $\approx 10\text{mm}$ ), then twist the wire strands and fold them back on themselves. For close clusters of lights it is possible to twist several droppers (of the same polarity – DO NOT mix red and black wires) together and fit these into a single connector



- ii) You can now insert the end of the wire into the connector, stop the wire just short of the opening at the end of the spade.

**CONTINUED ON NEXT PAGE >**

**Step 2 – Adding Lights - Continued**

- iii) Place the connector and wire into the jaws of the crimping tool **[Part D]** next to the red dot, or for connectors filled with only fine wire, next to the 10-22 mark may work better (as seen in the below photo). Then squeeze the jaws of the tool to secure the wire in the connector, this may require a reasonable amount of force compared to what is required for wire cutting or stripping.



- iv) After crimping the wire should be well secured in the connector.

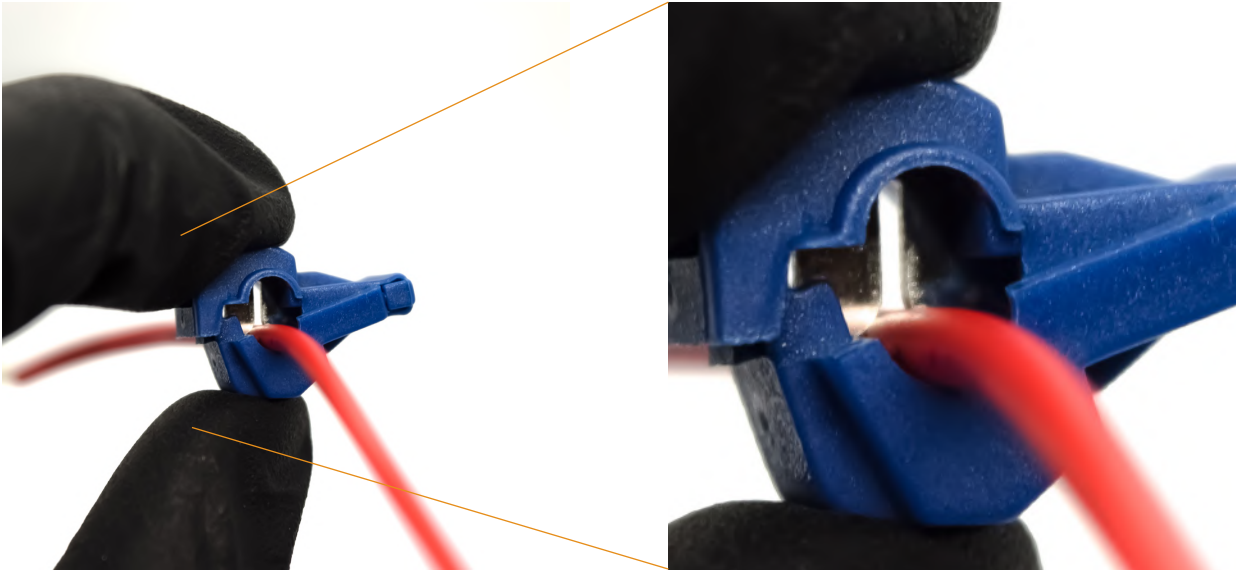


**CONTINUED ON NEXT PAGE >**

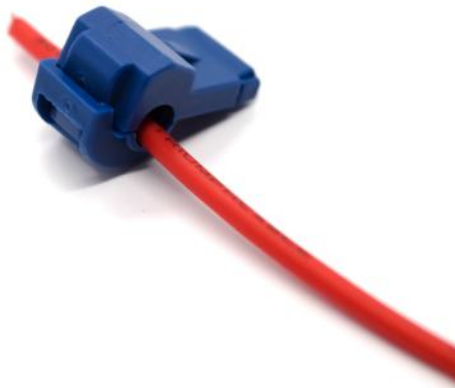


### Step 3 – Connecting lights to the bus

- 1) The next step is to fit the Crimp Blade Splice Connectors **[Part E]** to the bus wires. You will need one blue connector for every red tab connector. These should be positioned near to where the droppers come through the board and ideally with the connectors on both the black and red bus wire positioned closely to each other to make wire tracing easier. To fit a blue connector simply position it around the bus wire as shown in the image below with the wire sat in the small groove within the connector.



- 2) Use a pair of pliers to squeeze the two sides of the connector together, clamping down on the bus wire. The connector should make an audible click (or the small plastic latch should be seen to have clipped into place on the upper half of the connector) as seen below.

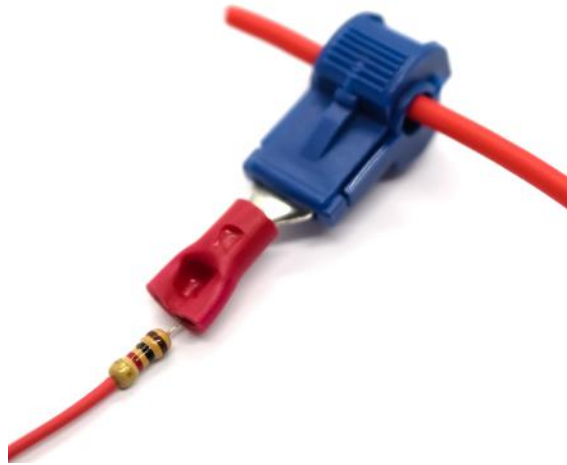


**CONTINUED ON NEXT PAGE >**



### Step 3 – Connecting lights to the bus - Continued

- 3) The red tab connectors can now be inserted into the slot on the end of the blue connectors for both the positive/red bus and negative/black bus. There should be an obvious click when the hole in the middle of the tab slots into place within the connector. It should now require a reasonable amount of force to pull the red tab out of the connector if done correctly.



- 4) Before adding any more lights it is advisable to test to make sure the circuit is working as this simplifies the troubleshooting process.

### Step 4 – Connecting the bus to the transformer

**STOP!** Before proceeding check that all connections are secure and that there are no short circuits, this could cause major damage to both any lights connected and the power supply. Ensure there are as few exposed metal surfaces as possible. Also double check that the polarity of every connection is correct, **DO NOT** mix positive and negative cables! As with any installation involving electricity it is advisable to have a qualified electrician verify the integrity of the work.

- 1) Once the system is determined to have been safely assembled, trim a small amount of the insulation from the end of both the black and red bus wires.

**CONTINUED ON NEXT PAGE >**

**Step 4 – Connecting the bus to the transformer - Continued**

- 2) Then insert each of the bus wires into the barrel plug connector **[Part B]**, with the black bus wire going in the terminal with the negative symbol above it and the red bus with going into the terminal with the positive symbol above it. Take care to ensure sure there is as small an amount of exposed wire showing outside of the terminal as is possible. Also make sure that no stray strands from the negative or positive bus are touching each other in any way, or that they would even be able to touch if the cables were moved.
- 3) Use a No. 1 Cross Head screwdriver to tighten the terminal block onto the bus wires. Once secured the bus wires should be held firmly in place.

**CONTINUED ON NEXT PAGE >**

**Step 6 – Adding power**

- 1) While this is definitely the most exciting step of the whole process, be sure not to rush and make sure everything you've done so far is correct and safe.
- 2) The first step is to plug your transformer/power supply **[Part G]** into your desired plug socket – DO NOT turn the socket on yet! Make sure the lead from the transformer comfortably reaches the barrel connector on the end of the bus wires, this connection shouldn't be under any considerable strain. If it does, you can now insert the barrel plug into the terminal block connector, if not, it is advisable to use a suitable extension cord so that the cable from the transformer isn't under strain.

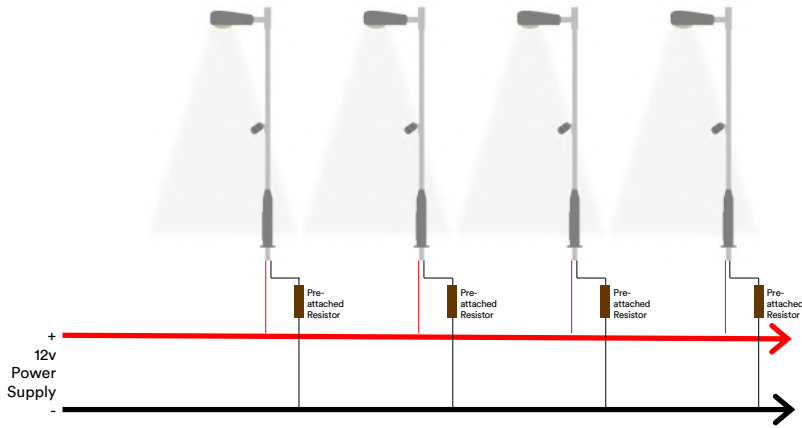


- 3) Now you've connected the transformer to the bus wire connector it's the moment of truth... turn it on at the wall and with a bit of luck your layout will be well on its way to looking great with your new lights!

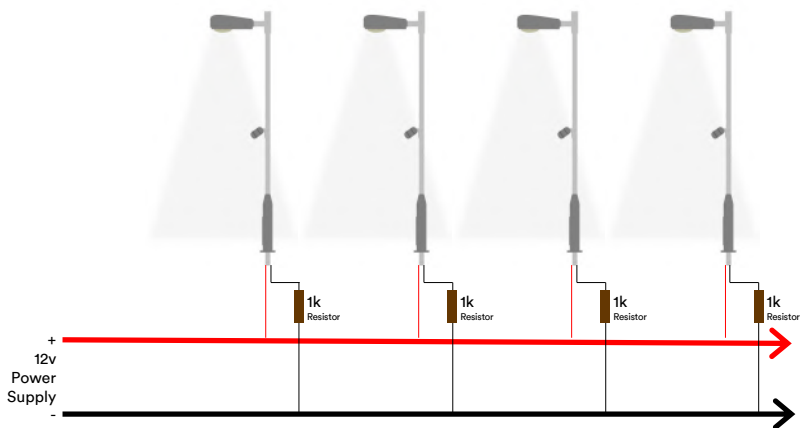
Assuming everything has worked you are now free to power the system off at the wall, wait at least 15 seconds for the system to fully discharge, then return to Step 2 and continue adding more lights!

**CONTINUED ON NEXT PAGE >**

## Simplified Wiring Diagram for ModelSigns Premium Lights



## Simplified Wiring Diagram for standard ModelSigns Lights



If you have any further questions or concerns feel free to get in touch through our website- [ModelSigns.ChrisGGroup.co.uk](http://ModelSigns.ChrisGGroup.co.uk)

Our YouTube channel “Ackworth Parkway” is going to become the place to go for ModelSigns product information and tutorials, so be sure to check it out!

We're on Instagram, Twitter and Facebook!  
Search for **@ModelSigns**



or email us... [ModelSigns@ChrisGGroup.co.uk](mailto:ModelSigns@ChrisGGroup.co.uk)

Kit manufactured for ModelSigns by:  
**Shenzhen Lihua Model Materials Co., Ltd**  
Longgang District, Bantian Street, The Third  
Industrial Park, Shenzhen City, P.R. China

