

ZSB-1

Zugschlussbeleuchtung

Spur H0

Train Rear Lighting

Gauge H0

Feu de fin de convoi

Echelle H0

Sluitverlichting

Schaal H0



Art.-Nr. 28-02-890

Anleitung

Manual

Mode d'emploi

Handleiding



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Technische Änderungen vorbehalten.

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Technische wijzigingen voorbehouden.



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How to use this manual

If you have no specialist technical training, this manual gives step-by-step instructions for safe and correct fitting of the train rear lighting, and operation. Before you start, we advise you to read the whole manual, particularly the chapter on safety instructions and the FAQ chapter. You will then know where to take care and how to prevent mistakes which take a lot of effort to correct.

Keep this manual safely so that you can solve problems in the future. If you pass the train rear lighting on to another person, please pass on the manual with it.

Intended use

The train rear lighting is designed for mounting on model railway carriages for gauge H0 according to the specifications of this manual.

The train rear lighting is not suitable for children under the age of 14. Reading, understanding and following the instructions in this manual are mandatory for the user. Any other use of the module is inappropriate and invalidates any guarantees.

Safety instructions

Mechanical hazards

Cut wires can have sharp ends and can cause serious injuries. Watch out for sharp edges when you pick up the PCB.

Visibly damaged parts can cause unpredictable danger. Do not use damaged parts: recycle and replace them with new ones.

Electrical hazards

- Touching powered, live components,
- touching conducting components which are live due to malfunction,
- short circuits and connecting the circuit to another voltage than specified,
- impermissibly high humidity and condensation build up

can cause serious injury due to electrical shock. Take the following precautions to prevent this danger:

- Never perform wiring on a powered module.
- Mounting the module should only be done in closed, clean, dry rooms. Beware of humidity.
- Only use low power for this module as described in this manual and only use certified transformers.
- Connect transformers and soldering irons only in approved mains sockets installed by an authorised electrician.
- Observe cable diameter requirements.

- After condensation build up, allow a minimum of 2 hours for dispersion.
- Use only original spare parts if you have to repair the module.

Fire risk

Touching flammable material with a hot soldering iron can cause fire, which can result in injury or death through burns or suffocation. Connect your soldering iron or soldering station only when actually needed. Always keep the soldering iron away from inflammable materials. Use a suitable soldering iron stand. Never leave a hot soldering iron or station unattended.

Thermal danger

A hot soldering iron or liquid solder accidentally touching your skin can cause skin burns. As a precaution:

- use a heat-resistant mat during soldering,
- always put the hot soldering iron in the soldering iron stand,
- point the soldering iron tip carefully when soldering, and
- remove liquid solder with a thick wet rag or wet sponge from the soldering tip.

Dangerous environments

A working area that is too small or cramped is unsuitable and can cause accidents, fires and injury. Prevent this by working in a clean, dry room with enough freedom of movement.

Other dangers

Children can cause any of the accidents mentioned above because they are inattentive and not responsible enough. Children under the age of 14 should not be allowed to work with this module.

Little children can swallow small components with sharp edges, with fatal results! Do not allow components to reach small children.

In schools, training centres, clubs and workshops, assembly, mounting and operation must be supervised by qualified personnel.

In industrial institutions, health and safety regulations applying to electronic work must be adhered to.

EMC declaration

This product is developed in accordance with the European standards EN 55014 and EN 50082-1, tested corresponding to the EC - directive 89/336/EWG (EMVG of 09/11/1992, electromagnetic tolerance) and meets legal requirements.

To guarantee the electromagnetic tolerance you must take the following precautions:

- Connect the transformer only to an approved mains socket installed by an authorised electrician.
- Make no changes to the original parts and accurately follow the instructions included with this manual.
- Use only original spare parts if you have to repair the module.

Operation overview

The train rear lighting consists of a light emitting diode (LED) formed like a lantern for the rear of the train and a printed circuit board (PCB) on which the necessary series resistor is located. The PCB may also be used to fix the LED.

Technical specifications

| | |
|--------------------------------|---|
| Supply voltage | 6 - 22 V alternating voltage (AC) or direct voltage (DC) |
| Current consumption | 4 - 30 mA (depending on the supply voltage) |
| Protected to | IP 00 |
| Ambient temperature in use | 0 - + 60° C |
| Ambient temperature in storage | -10 - + 80° C |
| Comparative humidity allowed | max. 85 % |
| Dimensions of the PCB | approx. 5,4 x 5,7 mm |
| Weight | approx. 0,1 g |

Checking the package contents

Check the contents of the package for completeness:

- two lantern shaped light emitting diodes for the rear of the train,
- two printed circuit boards,
- one manual.

Required tools and materials

Make sure you have the following tools and materials ready for use:

- an electronic soldering iron (max. 30 Watt) with a fine tip,
- a soldering iron stand,
- a tip-cleaning sponge,
- a heat-resistant mat,
- a small side cutter and wire stripper,
- a pair of tweezers,
- tin solder (0,5 mm. diameter) and wire.

Safe and correct soldering



Caution:

Incorrect soldering can cause dangers through fires and heat. Avoid these dangers by reading and following the directions given in the chapter **Safety instructions**. If you have had training in soldering you can skip this chapter.

- Use a small soldering iron with max. 30 Watt. Keep the soldering tip clean so the heat of the soldering iron is applied to the solder point effectively.
- Only use electronic tin solder with flux.
- When soldering electronic circuits never use soldering-water or soldering grease. They contain acids that can corrode components and copper tracks.
- Solder quickly: holding the iron on the joints longer than necessary can destroy components and can damage copper tracks or soldering eyes.

- Apply the soldering tip to the soldering spot in such a way that the wire and the soldering eye are heated at the same time. Simultaneously add solder (not too much). As soon as the solder becomes liquid take it away. Hold the soldering tip at the spot for a few seconds so that the solder flows into the joint, then remove the soldering iron.
- The joint should be held still for about 5 seconds after soldering.
- To make a good soldering joint you should use a clean and unoxidised soldering tip. Clean the soldering tip with a damp piece of cloth, a damp sponge or a piece of silicon cloth.
- After soldering check (preferably with a magnifying glass) tracks for accidental solder bridges and short circuits. This would cause faulty operation or, in the worst case, permanent damage. You can remove excess solder by putting a clean soldering tip on the spot. The solder will become liquid again and flow from the soldering spot to the soldering tip.

Mounting the train rear lighting

Start by deciding the position for the lighting. Drill two small holes for the connecting wires into the back of the carriage.

Solder the connecting wires for the connection to the power supply to the solder points X1 and X2 of the series PCB. Follow the connections diagrams fig. 1 and fig. 2 (page 22).

Next fix the PCB on the inside of the carriage beside the holes. Depending on the required direction the PCB may be mounted with the connecting cables branching off up or downwards.

Pass the connecting wires of the LED through the holes.

Note: The LED should be mounted with a small distance to the back of the carriage like in reality. Use a match as a spacer while mounting the LED.

Turn the legs of the LED in the direction of the PCB, and shorten them that they end directly above the solder points on the PCB. There are solder points on both sides which may both be used. Solder the connecting wires.

 **Caution:**

The legs of the LED should not be mounted crosswise to avoid short circuits.

 **Caution:**

While soldering avoid heating the back of the carriage. Parts made of plastic might go out of shape.

 **Caution:**

Each LED must be connected to the power supply via a series PCB of its own.

Connection to the power supply

Finally connect the connecting wires of the series PCB to the power supply. When connected to alternating voltage the polarity is not of importance. The LED lights independent of the direction of travel.

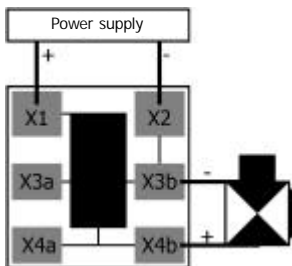
Connection to direct voltage

When connecting the train rear lighting to direct voltage you have to take into account the polarity. Please note that depending on the mounting direction of the series PCB the solder point X1 or X2 has to be connected to "+".

The LED lights only at forward motion. When it is supposed to light also at backward motion, you have to mount a rectifier (see fig. 3).

Connection to a locomotive or function decoder

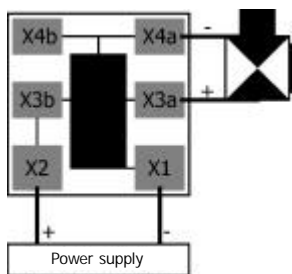
Connect the solder point "-" with the output of the decoder with which you want to switch the train rear lighting. The solder point "+" has to be connected to the return conductor of the accessory function output or with the return conductor for all functions. It is also possible to connect the solder point "+" with earth of the carriage housing. Please note that depending on the mounting direction of the series PCB the solder point X1 or X2 has to be connected to "+".



Connections fig. 1:

Connecting wires for the power supply branching off upwards.

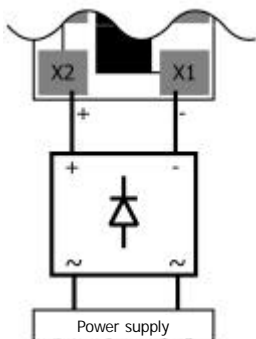
Connection of the diode alternatively to X3a or X4a possible.



Connections fig. 2:

Connecting wires for the power supply branching off downwards.

Connection of the diode alternatively to X3a or X4a possible.



Connections fig. 3:

Connection to direct voltage via a series rectifier.

FAQ

- Parts are getting too hot and/or start to smoke.



Disconnect the system from the mains immediately!

Possible cause: The supply voltage is too high. → Reduce the supply voltage according to the specifications in the chapter "Technical specifications".

- The LED does not light.

Possible cause: If connected to direct voltage the connections "+" and "-" are incorrectly connected. → Check the connections.

Possible cause: The connection to the power supply is interrupted. → Check the connections.

- The LED only lights on forward motion.

Possible cause: There is no rectifier mounted in series although connected to direct voltage. → Mount a rectifier according to fig. 3.

If you cannot find the problem, please return the train rear lighting for repair (address on the cover page).

Manufacturer's note

According to DIN VDE 0869, the person who brings the circuit into operation by extension resp. mounting into a housing is the manufacturer of the product. If he sells the product to another person he is responsible for passing on all the relevant papers and to give his name and address.

Certification

This product conforms with the EC- directive 89/336/EWG on electromagnetic radiation and is therefore CE certified.

Conditions of warranty

This product is guaranteed for two years. The warranty includes the correction of faults which can be proved to be due to material failure or factory flaw. We guarantee the adherence to the technical specifications of the circuit when assembled and connected according to the manual.

Other claims are excluded. By law, we are not responsible for damages or secondary damages in connection with this product. We retain the right to repair, make improvements, supply spare parts or return the purchase price.

The following invalidate the warranty:

- using an unsuitable soldering iron, solder containing liquid acids or similar,
- if damage is caused by not following the instructions in this manual
- if the module has been altered and repair attempts have failed,
- if arbitrary changes in the circuit are made,
- if additional components are added which are not described in the manual,
- if the copper tracks or soldering eyes are damaged,
- if damage occurs due to an overload of the module,
- if connected to a incorrect voltage or current,
- if damaged by other persons,
- if damaged by faulty operation or if damaged by careless use or abuse.

Aktuelle Informationen und Tipps:

Information and tips:

Informations et conseils:

Actuele informatie en tips:

<http://www.tams-online.de>

Garantie und Service:

Warranty and service:

Garantie et service:

Garantie en service:

Tams Elektronik GmbH

Rupsteinstraße 10

D-30625 Hannover

fon: +49 (0)511 / 55 60 60

fax: +49 (0)511 / 55 61 61

e-mail: modellbahn@tams-online.de