

## Instructions

### Art-Nr: 7110 Jitter-free backlights solid

1. These parts are not suitable for small children. There is a danger of swallowing.
2. The product can be seen in figure 1. These instructions are part of the product. Please retain them well.
3. This component is designed for voltages up to 16 volt. So it is suitable for customers with analog or digital Z-model trains as well as for those with analog or digital N-model trains.
4. When using it with analog throttles, the output voltage of the throttle should not exceed an effective value of 16 volt. Please inquire at the manufacturer of your throttle.
5. When using it with a digital system, make sure that the output voltage of the digital control center has been limited to an effective value of 16 volt. Please inquire at the manufacturer of your digital control center. Make sure you use the component only for its intended purposes. Inappropriate use and overvoltages can destroy the product. We do not assume any liability for damages caused by inappropriate use.
6. All the components are firmly soldered. The feeding is done through 2 magnet wires with a diameter of 0,2 mm. They are already mounted onto the component, the other end is already tin-plated. The wires can be shortened or extended as desired, though they should not be cut below a length of 10-15 mm at the component. If they are shorter, the heat emerging when soldering can damage the component. The wires do not have any marking for + or – since the lights of the component are working in any running direction, so the wires can be connected in any way onto the contacts to the tracks. Our magnet wires are insulated with a very resistant lacquer, so no other insulation is necessary.
7. In figure 2 you can see as well the connections for the LEDs. The component operates up to maximal 3 LEDs in red. All the LEDs have to be connected in parallel. The brightness has been set fixed by us with a resistor. The component works best with our LEDs 7050 or 8100. Other degrees of brightness can only be obtained by changing the resistor. After consultation with your local dealer, it is normally also possible to operate yellow LEDs with the component. Other colors than red or yellow can not be operated with this component.
8. Looking onto the component like in figure 3, on the top left in the corner you can see the output for plus, so for the anode of the LED, and on the outer right with the long conductor the output for minus, so for the cathode of the LED. The cathodes of our LEDs are marked with black color. An incorrect polarity though does not inflict any damage, neither on the component nor on the LED, the only problem is that the LED won't be working.
9. With the component you can also operate 1,2 – 1,5 volt miniature bulbs. However, do not operate more than one bulb per component. The component provides a maximum of 2,5 volt and 10 mA. Before operating miniature bulbs, it is absolutely necessary to adjust the resistor. Since the data of the manufacturers of miniature bulbs are strongly differing, this is only possible with the help of your local dealer.
10. If employing the component in a metal model, it has to be completely insulated with insulating tape or better with heat shrink tubing. After connecting the LEDs, it has proven of value to fix the component onto the body with a little glue, so that it does not get into contact with the metal or the LEDs. Even though the input and the output themselves are largely short-circuit proof, a contact of the output voltage with the track potential in any case will destroy the component. So do not connect any of the four contacts with each other. There is also no common ground like it often used to be with older components. All the four contacts carry a different potential.

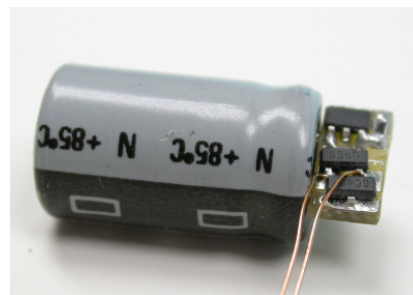


figure 1: The component for jitter-free backlights

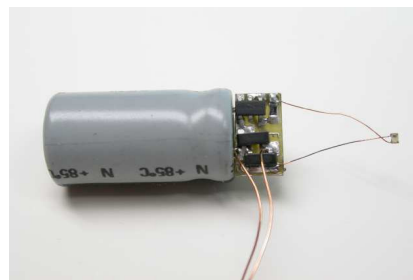


figure 2: correct connection of the LEDs

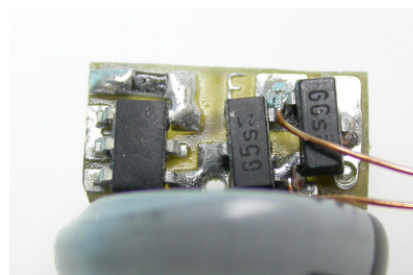


figure 3: On the top left the plus output or the anode, way on the right the minus output or the cathode

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11. According to this, the contact surface for the connection of the LEDs has been made quite small. We recommend that you work with great care and use only appropriate tools. The soldering iron should have a maximum temperature of 300 degrees Celsius (572 degrees Fahrenheit) at its tip, and the tip should be smaller than 1mm.
12. Please do not solder at other soldering points. Some of the components are very heat-sensitive, which is normal for the small SMD-components. Particularly in the input area we already have pre-mounted the wires. It is logical that these small wires do not withstand any heavy impacts and easily break if you bend them to and fro too often. If this happens, do not try to resolder them, better contact your local dealer.
13. If the LEDs have been affixed to the model and correctly soldered onto the component, do a function test so see if everything is working correctly and the LEDs are shining. The best way to do this is with extra wire and small clamps. If everything is ok, the magnet wires from the input can be connected to the current collectors. After having closed the model again, do another function test, this time on the tracks.
14. The LEDs will start shining evenly bright and jitter-free instantly after being connected to voltage, also to a very low one. The way lights are shining mainly depends on the LEDs and the preset brightness. Of course, the more low-current the LEDs and the smaller the number of LEDs operated, the better the component can power the LEDs when the power supply is interrupted. Because of this, the time the condensator can bridge is differing, but usually should reach at least 3 seconds.
15. The only requirement for the employment of the component is the use of a pulse-modulated or pulse-width-modulated running controller, as nowadays is used everywhere in the Z-model world. You will get another specially nice effect when using our controller, since thanks to an additional function it still lets the lights shine when the train is standing.
16. We are proud that with this new technique, we Z-train and N-train specialists again have come another step closer to the original trains.
17. High Tech Modellbahnen manufactures its products with the greatest possible care. We issue a guarantee and warranty according to legal regulation. Should you find any new product you just bought defective, please contact your local dealer.
18. It can always happen that somebody damages something by inappropriate use or something simply gets broken. Since the parts are very small, it is not advisable trying to repair broken parts by yourself. Please contact your local dealer who might be able to save them instead of a self-repairing try that might end up in a total economic loss.

Now enjoy working with your new electronic device and always have fun with your model trains.

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