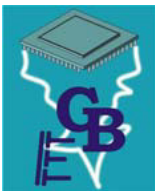


Operation Manual

Terminal Clamp

AKL-8-W



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Function

The AKL-8 terminal clamp was specially designed to connect LEDs, relays, smoke generators and other consumers easily and without soldering to the switching outputs of the BEIER-modules.

The terminal clamp is suitable for following BEIER-modules:

- Sound module USM-RC-3
- Sound speed controller SFR-1
- Double sound speed controller SFR-1-D
- Sound speed controller for Torro / Taigen and Heng Long SFR-1-HL
- Speed controller UFR-1230
- Double speed controller UFR-1230-D
- Light modules LM-BT-16-4 and LM-IR-16-4

Included in the delivery of the AKL-8-W are eight resistors each with the values:

- 0 Ohms (only 1 **Black** ring),
- 150 Ohms (**Brown**, **Green**, **Brown**)
- 330 Ohms (**Orange**, **Orange**, **Brown**)
- 680 Ohms (**Blue**, **Gray**, **Brown**).

The negative switching outputs 1 - 8 or 9 – 16 of the modules can be connected directly via the spring-loaded terminals of the clamp. The common positive pole is located at terminal 9 and 10. The positive pole is supplied from the internal positive pole of the supply voltage (battery +) connection.

For example, at the SFR-1 the terminal clamp can be plugged into the slots X3 or X4.

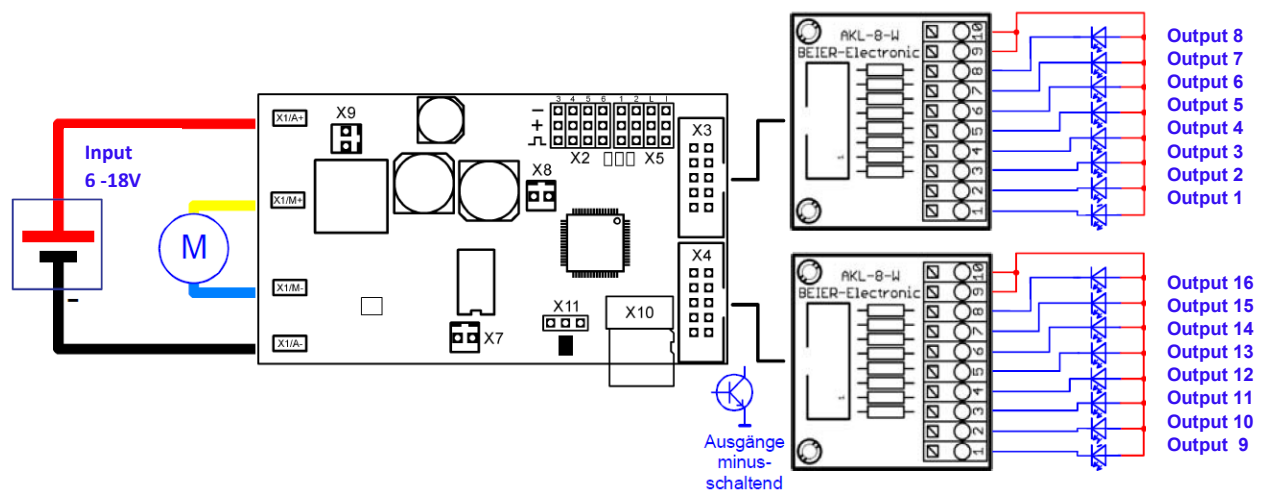
At the UFR-1230, the terminal clamp is plugged into X5. The outer brown cable must point to the center of the board, and the black to the edge of the board.

The terminal can now be used for an easy wiring of the model lighting.

Technical specifications

Connection terminals:	<u>Sound speed controller (SFR-series) / Sound module USM-RC-3 and Light modules LM-IR/BT-16-4:</u> Clamp 1 to 8: Switching outputs 1 – 8 or 9 – 16 (minus-switching) Clamp 9 and 10: Plus pole of supply voltage <u>Speed controller (UFR-series):</u> Clamp 1 to 8: Switching outputs 1 – 8 (minus-switching) Clamp 9 and 10: Plus pole of supply voltage
Connection cable:	10-pin Ribbon cable, 20cm long, directly pluggable to the SFR and UFR modules
Dimension:	38 x 36 x 17 mm
Weight:	18 g

Connection example to sound speed controller SFR-1



Connection of LEDs and other components

The connection cables of the consumer/component/light can be connected to the spring-loaded terminals of the AKL-8-W. To insert or remove a cable, just press from above with a small screwdriver on the operating lever of the terminal. This opens the clamp and the cable can be plugged in or out.

The cables should be stripped approx. 7 - 8 mm and be tinned with solder. The cable cross-section can be between 0.14 mm² and 1.0 mm².

The switching outputs of BEIER-modules are negative switching, i.e. the negative lead of the consumer is always connected to the outputs 1-8 of the terminal clamp. The positive lead of the consumer to output 9 or 10 of the terminal clamp.

The switched voltage at the eight outputs is always as high as the module supply voltage! Therefore, it is important to have the correct in series resistors inserted in the base of the AKL-8-W (see below)!

The required value of the series resistor depends on 3 different factors:

- Level of the supply voltage (U_B)
- Voltage of the LED (U_L). Added together when connecting several LEDs in series the individual stresses.
- Current of the LED (I)

The series resistance value (R) can be calculated using the following formula:

$$R = \frac{U_B - U_L}{I} \quad U_L = (U_{L1} + U_{L2} + U_{L3} + U_{Ln})$$

Example:

We have a supply voltage of 7.2 V and want a white LED with a supply voltage 3.4 V and 12 mA (= 0.012 A).

$$R = \frac{7.2 \text{ V} - 3.4 \text{ V}}{0.012 \text{ A}} = 317 \text{ Ohms}$$

However, since there is no resistance value of 317 Ohms available, we take the closest available value of 330 Ohms.

Then the necessary power (P) of the resistor should also be checked:

$$P = (U_B - U_L) \times I$$

$$P = (7.2 \text{ V} - 3.4 \text{ V}) \times 0.012 \text{ A} = 0.046 \text{ W}$$

In this example, a standard resistor with a power of 0.250 W (1/4 W).

When connecting relays or other inductive loads (e.g. motors) free-wheeling diodes (e.g. 1N4007) must be used.

The free-wheeling diodes must be connected in blocking direction parallel to the consumer.

The enclosed 0 Ohm "resistors" can be used as a bridge if no in series resistor is required at any output.

Disposal note:

Discarded electrical and electronic equipment contains a multitude of valuable resources, including precious metals and critical raw materials. Achieving a high collection and recycling rate and the associated return of these raw materials into the production cycle is one of the central goals of the environmentally friendly and sustainable disposal of electrical and electronic equipment.

For this reason, our modules must not be disposed of with normal household waste, but must be collected separately. The communal collection points, such as recycling centers, can be used for this. Larger dealers also offer take-back points that can be used even if the product was not purchased there. We are happy to take over the professional and free disposal. To do this, send the module back to us with sufficient postage (!!!).

