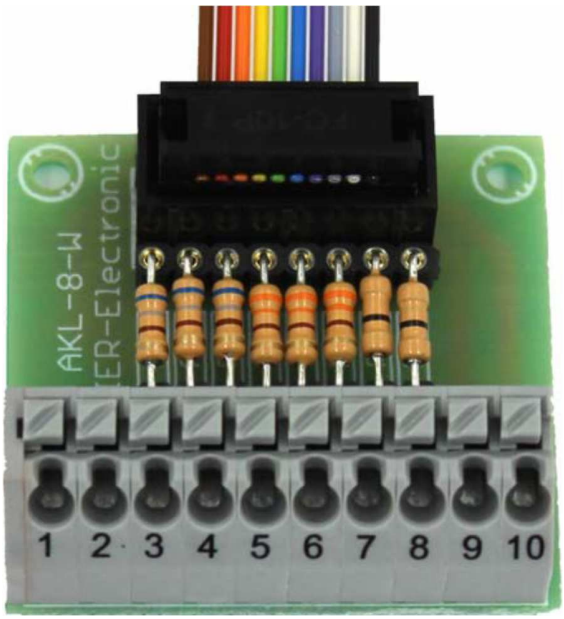
Operation Manual Terminal Clamp AKL-8-W



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Function

The AKL-8-W terminal clamp was specially designed for the modules of the SFR (sound speed controller) and UFR (speed controller) series to allow an easy connection of LEDs, relays, smoke generators and other consumers to the switching outputs.

As a special feature, the AKL-8-W terminal has eight slots for series resistors to simplify the connection for LEDs.

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 SFR and UFR 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.

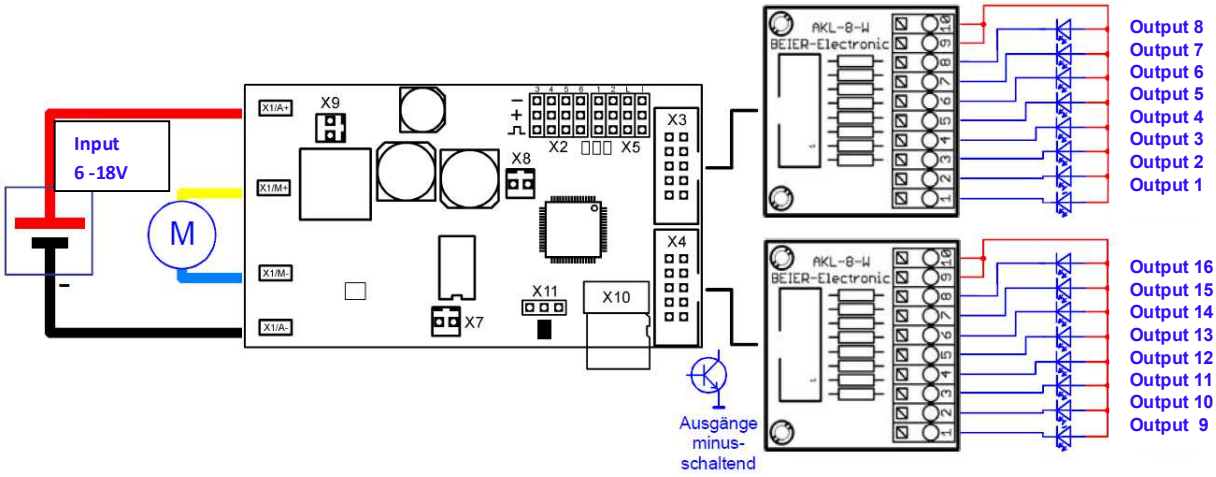
At the UFR-1230, the terminal clamp is plugged into X5. The outer brown cable must point to the center of the board, and the black to the edge of the board.

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

Technical specifications

Connection terminals:	Sound speed controller SFR series: Terminal 1 to 8: switching outputs 1 - 8 or 9 - 16 of the sound speed controller (minus **-** switching) Terminal 9 to 10: positive **+** pole of the supply terminal UFR speed controller series: Terminal 1 to 8: switching outputs 1 - 8 of the Speed controller (minus **-** switching) Terminal 9 to 10: positive **+** pole of the supply tension
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 the SFR and UFR 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 SFR or UFR 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:

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

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).

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

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:

$$P = (U_B - U_L) \times I$$
$$P = (7.2\ V - 3.4\ V) \times 0.012\ A = 0.046\ W$$

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.