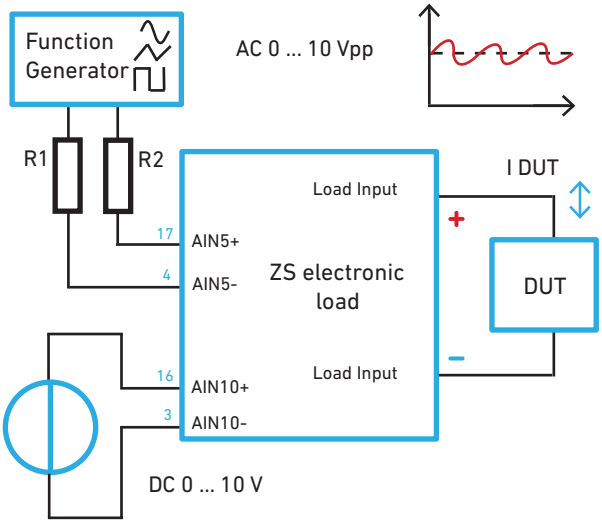
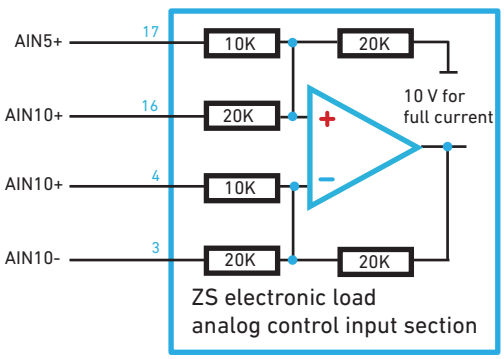
Höcherl & Hackl
The electronic load

Application Note #4

Superimposition of AC Current with ZS Loads

By controlling the analog control input by a DC voltage and an AC voltage from a function generator it is possible to produce a load current with superimposed AC current.





Applications

- dynamic test of power supplies, electric motors at switching on
- simulation of loads with superimposed AC current

Setup

The ZS electronic loads provide two analog control inputs for the levels 0 ... 5 V and 0 ... 10 V.
These control inputs are connected to an internal adder.
If only one control input is connected only this signal is exclusively used to control the current. When both control inputs are connected the control voltages are added in the ratio of their nominal voltages (5 V or 10 V).
By two external resistors the factor for the addition can be changed.
The schematic aside shows the analog control input section of the ZS electronic load and enables the calculation of the required resistors.

Example

When R1 and R2 are chosen with 190 kOhm each, the 5V control input changes to a 10 % ratio corresponding to the 10V control input.
When a function generator is connected with a 10 Vpp AC voltage max. 10 % of the current range can be controlled.

Note

The mean value of the current does not change by the superimposed AC current. However, it has to be considered that the peak current must not exceed the maximum current of the device even if the mean value is within the setting range. When an AC level with higher peak current than the DC current is set the resulting control voltage becomes negative. In this case distortion can appear.
The maximum frequency is determined by the regulation speed of the electronic load (see rise and fall times in the technical data).