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 REK RK8511 150V/30A/150W DC electronic load (short review, pictures, calibration)

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Author Topic: REK RK8511 150V/30A/150W DC electronic load (short review, pictures, calibration)

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REK RK8511 150V/30A/150W DC electronic load (short review, pictures, calibration)

Quote

« on: October 08, 2013, 07:53:11 AM »

Hi,

I bought an electronic load from a Chinese eBay seller (shipment from uk) for 280 €. It looks similar to other loads I found on the forum, but there are differences. Here is a quick description of the device. I haven't used it much since, but so far, I it performs fine for the price. There are a few other threads mentioning the RK8511.

It came with a printed Chinese manual, a power cord (I think for the UK) and a travel adaptor. The power cord felt very cheap and I was able to touch the contacts with the plug half inserted into the travel adaptor. I threw those away and used a standard IEC power cord.

-> Photos

coming soon. Compared to the similar looking, but higher priced units from other vendors, I noticed at least a missing varistor and I'm sure there are more differences to get the price down...

-> Features

It supports CC, CV, CR, CP, CC+CV, CR+CV and "short mode" which should give zero ohm resistance. You can set it to switch on and off at certain voltages and it has a transient mode (settings are low current, high current, rise time, fall time, high time, low time and trigger modes (continuous, pulse, trigger). There is a battery test function which counts the Ahs up.

You can set the maximum voltage and current through the menu. If you set it to > 3A or > 16V, a relay clicks and you get one digit less resolution for U or I.

Compared to other brands, the display output of the last digit is truncated. But in the pc software, you see all digits.

-> PC connection and software

There is a serial output (ttl, not isolated from the load!, can be dangerous, the shield of the DB9 connector is connected to GND of the source...). No isolating adaptor was included. There are kits available on eBay which include a software cd and an isolating rs232 or usb converter.

I built a converter using a serial ttl to usb converter (ebay) and 2 slow optocouplers... should have used faster ones because my construction only works up to 9600 baud.

The Chinese seller was not able to give me a link to a working software, although the eBay offer said "free software". But it turned out the Maynuo software works fine 😊 .

-> Calibration

When I got the unit, it was not accurate. There was a large offset. So even when set to 0A, there was a current of about 40mA. Thanks to LaurenceW I was able to figure out how to calibrate the load. It's now spot on with my Rigol 3061 and the Hameg HMP4040 power supply.... but only at the right temperature. It has a high drift.

For calibration, you need a 150 V voltage source (low current) and a 30A current source and of course a meter that can measure 30A....

I'll post the procedure and a description of my setup soon.

good_cap/bad_cap

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good_cap/bad_cap

Contributor

Posts: 10



 **Re: REK RK8511 150V/30A/150W DC electronic load (short review, pictures, calibration)**

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« **Reply #1 on:** October 22, 2013, 01:46:35 AM »

So here is how to calibrate the load. Do it at your own risk. The values might be different on loads that can handle higher voltages/currents/powers. Mine is a 150V 30A 150W model. You can calibrate voltage, current and sense voltage independently.

Do not get confused by the display output. For example if it shows IH_H = 4,5 A it does not mean it is supposed to draw 4,5 A and it does not mean you have to feed in a current of 4,5 A. It just seems to be some internal calibration values that have no meaning for calibration at all. You simply have to connect a sufficient voltage / current source, measure and enter the values. The eload does the rest.

Here is the procedure for voltage:

I calibrated the voltage using an adjustable isolation transformer, a rectifier, cap and a 33k resistor in series to create a "high voltage" high impedance dc source of 3 to 150 V (and far more). This voltage does not have to be stable since the eload regulates it by drawing the right amount of current.

Requirements: 150 V DC source which can be clamped down to 1 V at low current without taking damage, voltage meter. Set the voltage source to 150 V or slight below. Let the load limit the voltage by drawing current. Do not turn down the voltage by yourself.

- 1) Press Shift, Up, Down, Enter (one after another) to enter cal mode (display shows cal). Enter the password 666 and Enter. Display shows "input calibration"
- 2) Press CV-Button to select voltage calibration.
- 3) Switch on 150 V DC source
- 4) The Display suggested UL_L= 1.000000... V. The load draws current so that voltage goes down (for me it was about 1 V). Measure voltage and enter measured value into the eload, press enter.
- 5) Display suggested UL_L= 19.000000... V. Measure voltage (was around 19 V) and enter measured value into the eload, press enter.
- 6) Display suggested UL_L= 1.000000... V. Measure voltage (was 1 V) and enter measured value into the eload, press enter.
- 7) Display suggested UH_H= 28.00000...V. Measure voltage (was 150 V) and enter measured value into the eload.
- 8) Press ESC to end calibration.
- 9) Switch off power supply, switch off eload.

Here is the procedure for current:

Requirements: >25 A DC source, voltage high enough to compensate for the drop on the wires. I used 5 V. The load drew a maximum of 25 A during my calibration, so this is 125 W.... (watch for the the maximum power rating of your load...).

The load will draw as much current as needed for calibration. Do not limit the current by yourself. I got the 30 A by wiring all my power supplies in parallel. It worked fine, but I could not take exact measurements of such high currents.

- 1) Press Shift, Up, Down, Enter to enter cal mode (display shows cal). Enter the password 666 and Enter. Display shows "input calibration"
- 2) Press CC-Button for current calibration.
- 3) Switch on 30 A source
- 4) Display suggested IL_L= 0.20000...A. The load drew about 200 mA. Measure and enter measured value into the eload, press enter.
- 5) Display suggested IL_H= 2,00000.. A. The load drew about 2,5 A. Measure and enter measured value into the eload, press enter.
- 6) Display suggested IL_L= 0,500000...The load drew about 530 mA. Measure and enter measured value into the eload, press enter.
- 7) Display suggested IH_H= 4,5.... The load drew about 25 A. Measure and enter measured value into the eload, press enter.
- 8) Press ESC to end calibration.
- 9) Switch off power supply, switch off eload.

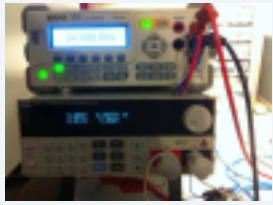
The procedure for the sense connectors at the back of the device is the same as for voltage calibration. To

enter sense calibration, use the CP button.

Connect the high impedance power supply (150 V) to the front connectors of the eload and connect the sense inputs at the back with the front input of the load.

The first picture shows the load after voltage calibration. I'm feeding in a higher voltage with high impedance. The load is set to CV mode and 5V. The result is spot on. Unfortunately, the load has a high drift. When I did this, it was hot (about 30°C) in the room.

The second picture shows the software. Note that there is one additional digit.



Load.jpg (43.82 kB, 640x478 - viewed 470 times.)



Software.jpg (50.65 kB, 640x478 - viewed 319 times.)

« Last Edit: October 22, 2013, 02:45:19 AM by good_cap/bad_cap »

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