

RoeTest – Computer Tube Tester / Tube Measuring System

(c) - Helmut Weigl www.roehrentest.de

Options – Range adjustments:

The adjustments have to be adapted to your hardware otherwise wrong voltage and current values will be displayed. This depends both on the used Pic (10 bit resolution up to firmware 4.x or 12 bit resolution since firmware 5.x) and the measuring- / voltage ranges.

Adjustments for Pic with 10 bit D/A converters (up to firmware 4.x – up to RoeTest V4):

The picture shows the values for the **RoeTest3 with 4A heater current range.**

The **RoeTest4 is capable of supplying up to 5A** so you have to enter 5115 mA at “Heizstrom hi” (4 mA per step x 1023).

Messbereiche:				Spannungsbereiche:			
5 V am A/D-Wandler ergeben (Wert 1023):		Auflösung (1024 Stufen):		5 V am D/A-Wandler ergeben (Wert 255):		Auflösung (256 Stufen):	
Heizspannung hi	127,8750	0,125	V	Heizspannung hi	127,5000	0,5	V
Heizspannung lo =1/10	12,7875	0,0125	V	Heizspannung lo =1/10	12,7500	0,05	V
Anodenspannung	306,9000	0,3	V	Anodenspannung hi	306,0000	1,2	V
G1-Spannung	51,1500	0,05	V	Anodenspannung lo	51,0000	0,2	V
G2-Spannung	306,9000	0,3	V	G1-Spannung hi	51,0000	0,2	V
G3-Spannung	51,1500	0,05	V	G1-Spannung lo	5,1000	0,02	V
				Hardwarezusatz für Anodenspannungserhöhung:			
Heizstrom hi	4092,0000	4	mA	Erhöhung um:	300		V
Heizstrom lo =1/10	409,2000	0,4	mA	Erhöhung wenn über:	303		V
Anodenstrom hi	255,7500	0,25	mA				
Anodenstrom lo =1/10	25,5750	0,025	mA				
G2-Strom hi	51,1500	0,05	mA				
G2-Strom lo =1/10	5,1150	0,005	mA				

Anmerkungen:

1. 1/10: Die lo-Bereiche müssen genau 1/10 des hi-Bereiches sein
2. Heizspannungs-Messbereiche werden zusammen mit Heizspannungsbereich umgeschaltet
3. Die Mess-/Spannungsbereiche sind so zu wählen, daß sich gerade Auflösungen ergeben
4. Die Hardware muß auf obige Werte abgeglichen sein

Vorsicht:
Bei Änderung der Bereiche muß auch die Hardware angepasst werden!

abbrechen übernehmen OK

Adjustments for Pic with 12 bit D/A converters (since firmware 5.x, since RoeTest V5):

RoeTest - professional tube-testing-system - range settings
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ranges of meters:

5V at the ADC result in: resolution: 12 Bit

heater hi	127,968750	0,03125	V
heater voltage lo =1/10	12,796875	0,003125	V
Plate- / Anode voltage	307,125000	0,075	V
grid1-voltage	51,187500	0,0125	V
screen voltage	307,125000	0,075	V
grid3/suppressor voltage	51,187500	0,0125	V
Heater current hi	5118,750000	1,25	mA
Heater current lo =1/10	511,875000	0,125	mA
Plate current hi	255,937500	0,0625	mA
Plate current lo =1/10	25,593750	0,00625	mA
screen grid current hi	51,187500	0,0125	mA
screen grid currer=1/10	5,118750	0,00125	mA

Hint: The measure ranges can differ from max. allowed continuous currents

voltage ranges:

maximum value at DAC results in: resolution:

heater hi	127,5000	0,5	V	8 Bit
heater voltage lo =1/10	12,7500	0,05	V	
Plate- / Anode voltage hi	306,0000	1,2	V	8 Bit
Plate- / Anode voltage lo	51,0000	0,2	V	
grid1-voltage hi	51,0000	0,2	V	8 Bit
grid1-voltage lo	5,1000	0,02	V	
screen voltage	306,0000	1,2	V	8 Bit
grid3/suppressor voltage	51,0000	0,2	V	8 Bit

Hardware extension for increased plate voltage:

increase by: V

increase if above: V

Caution:
adjust hardware when modifying ranges

reset (Attention: Changes the ranges!)

RoeTest V0-V3 (Pic 10Bit, Firmware <=4.x, H: 4A)

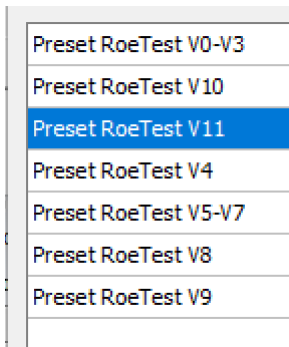
RoeTest V4 (Pic: 10 Bit, Firmware <=4.x, H: 5A)

RoeTest V5-V7 (Pic 12 Bit, Firmware >=5.x, H: 5A)

Remarks:

- 1.1/10: "low" rating must be exactly 1/10 of "high" rating
- 2.) Heater voltage instrument scales change according to heater voltage range.
3. Select instrument and voltage ratings in a way that provides even results.
4. Hardware must be calibrated as indicated above

For easier adjustment of the ranges some presets have been defined:



Use these presets before you calibrate your device. Then save the settings in a new preset with a new name, e.g. 'MyRoeTest V11 2025.03.10'.

**Caution: Do not change anything here if you do not change your hardware!
An adjustment for the correct hardware is only needed once.**

I have chosen the designed measure and voltage ranges very carefully so that as much as possible (receiver -) tube types can be tested with still passable complexity. The hardware I designed is adapted to these measure and voltage ranges.

Again and again I get inquiries for other ranges. Some wishes are very extreme (anode currents up to 2A,... higher heating currents up to 10 A, ... higher anode voltages up to 1000V ...). By using the range adjustments the software is now capable to also support hardware with other ranges (untested and not guaranteed).

If you want to build the RoeTest using other ranges please consider the following:

- It is not sufficient to just use semiconductors capable of higher voltages of currents, all components have to be adapted (even relays, pcb tracks, wiring ...).
- Consider the power dissipation and the generated heat
- Eventually a completely different circuit has to be built
- The hardware must be compatible with the Pic (voltage ranges are controlled by D/A converters in the range from 0-5 V; the A/D converters for the measuring ranges also accept 0-5 V; the number of the voltage and measuring ranges cannot be changed)
- When using larger ranges the resolution will degrade
- Costs will rise more than proportional the more extreme the wishes are
- I cannot give you any support for other builds!

Think over carefully if it is not possible to get along with my suggested ranges. Nearly every tube can also be tested using lower voltages. And if there is eventually a tube with a high heater current: Build an adapter. The tube can also be heated using an external power supply (potential-free) connected directly to the tube's heater pins. The connections to the internal heater supply are just left unconnected in this case.