

Modular Tester user guide: esr meter

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The ESR meter is based on the famous design by Bob Parker as published in Electronics Australia and Silicon Chip.

It measure the ESR (Equivalent Series Resistance) of electrolytic capacitors, the ESR is given in Ohms and is an indication of health of the capacitor.

Capacitors age over time and with use in high temperature environments or high frequency pulse circuits such as SMPS (Switch Mode Power Supply), the electrolytic can dry up or they can start leaking electrolytic fluid.

It has 3 measurement ranges (0.99, 9.9 and 99 ohm) and is auto-range.

After power on the module shows the splash screen and goes to sleep.

Press the rotary encoder and hold until the splash screen appears.

Short the test leads together and press the rotary encoder button to calibrate to 0 ohm.

The calibration results are saved so there is no need to repeat unless test leads are changed.

Use decent banana plugs and test clips since poor quality parts introduce resistance to the circuit.

Make sure the capacitor is discharged before measuring!

Since a low voltage is used for the measurement capacitors can be measured in circuit but this is not advised since any parallel capacitors influence the measurement.

Connect the capacitor to the test leads, the tester will auto-range and show the value of ESR.

Turn the encoder to scroll through the reference table.

The table can be used as a guideline to determine if a capacitor is good or bad. In many cases the value measured will be a multiple of the given upper limit if the capacitor is bad.

Press encoder long for the menu, turn to select, press to select or toggle setting:

Return: return to main screen.

Go to sleep: put the module to sleep.

Reset calibration: resets the “0” calibration values, for debugging purposes.

Calibration procedure

There is one point of calibration, the gain of the measurement amplifier.

Connect a 68 ohm 1% resistor and adjust trimmer until it reads 68.

Check with a 5.6 ohm resistor.



