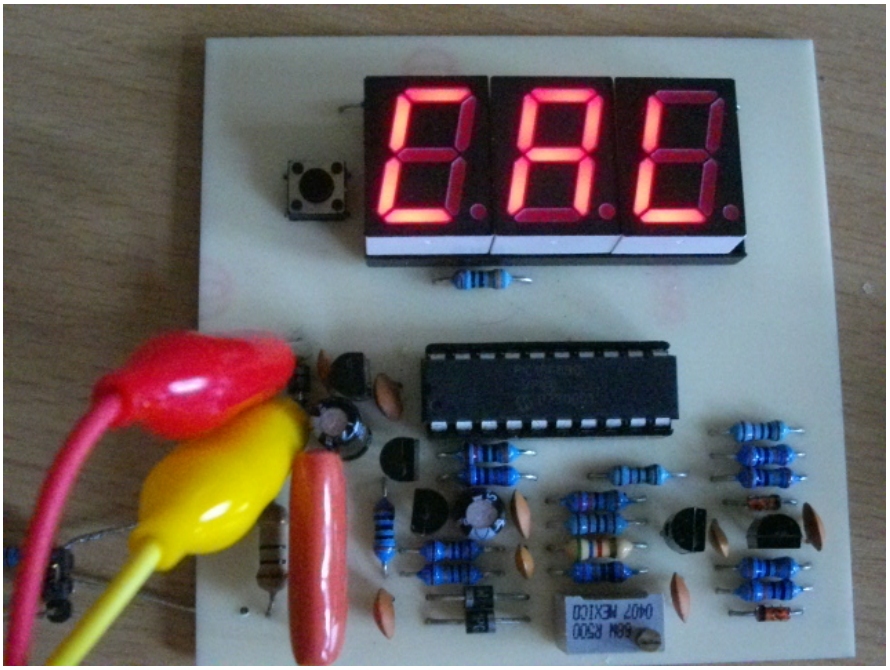
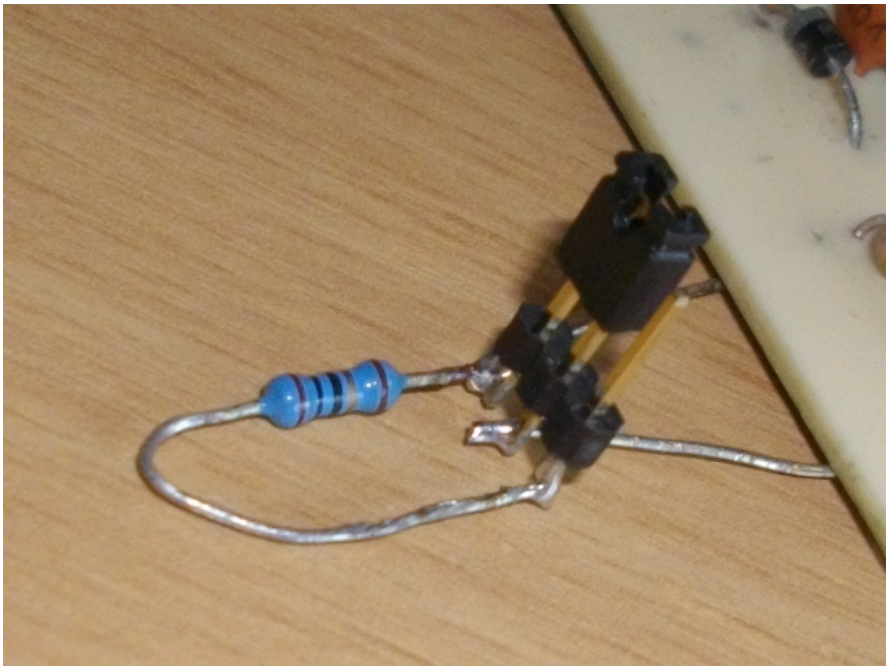
At startup, if the unit is not yet calibrated, a blinking "CAL" will be displayed:

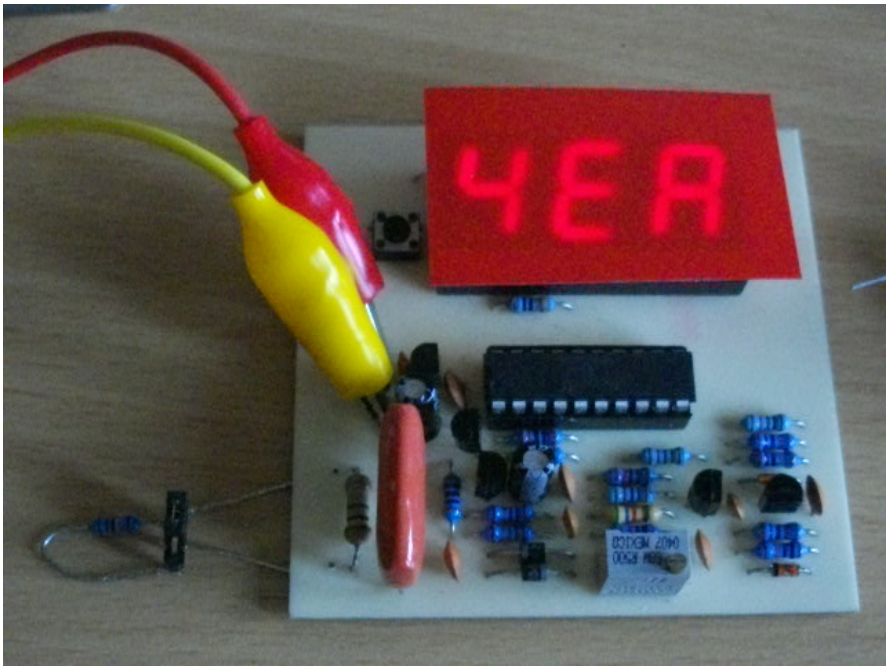


I used the following circuit to simplify the calibration:

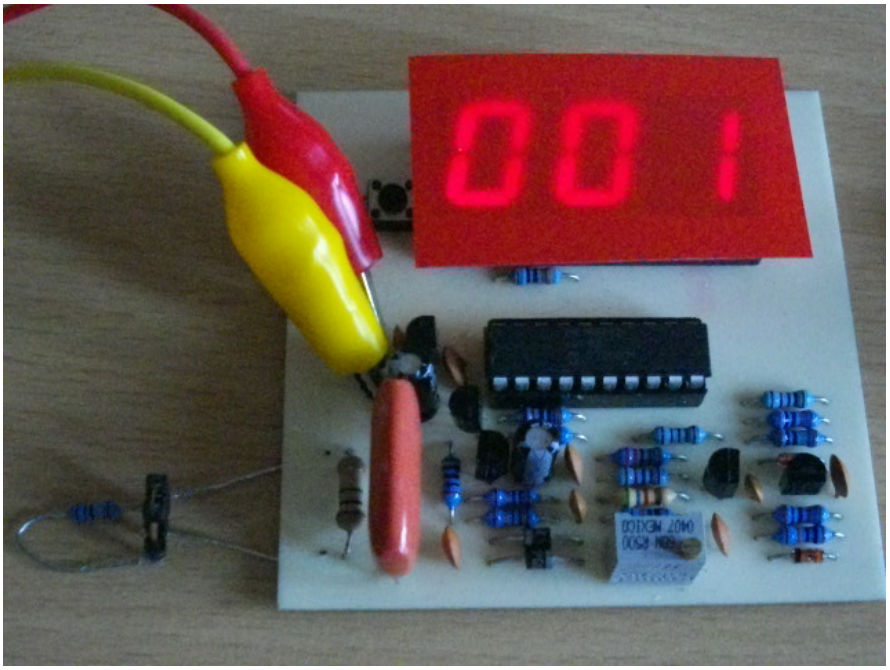


The resistor is 10 ohm 1%. The header is for easily selecting between 0 ohm and 10 ohms. It must be connected directly to the circuit board.

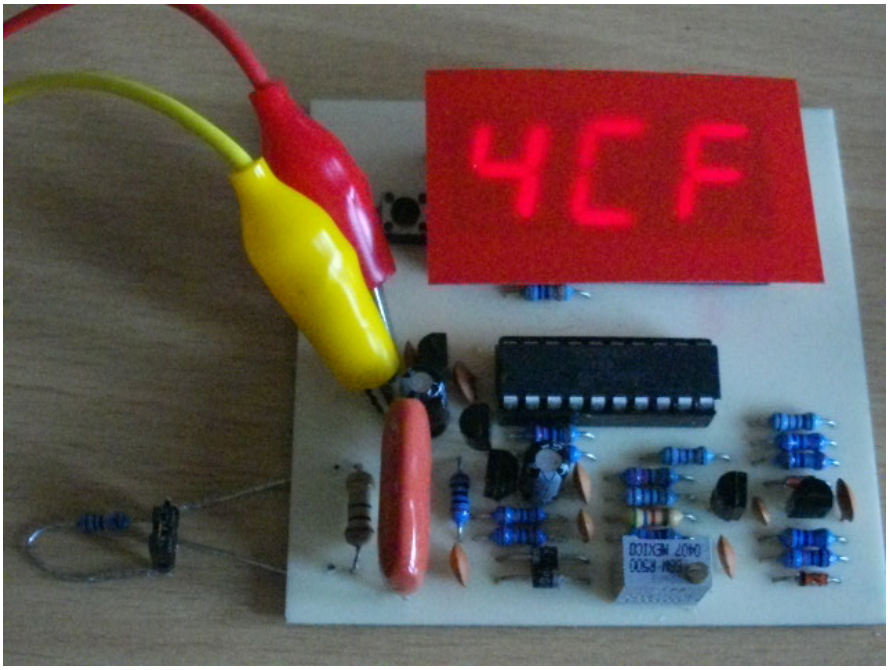
After pressing the button, the display will show the current ADC value in hex:



After the unit is sufficiently warmed up, short the inputs and wait until display is stable then press the button to zero the reading.

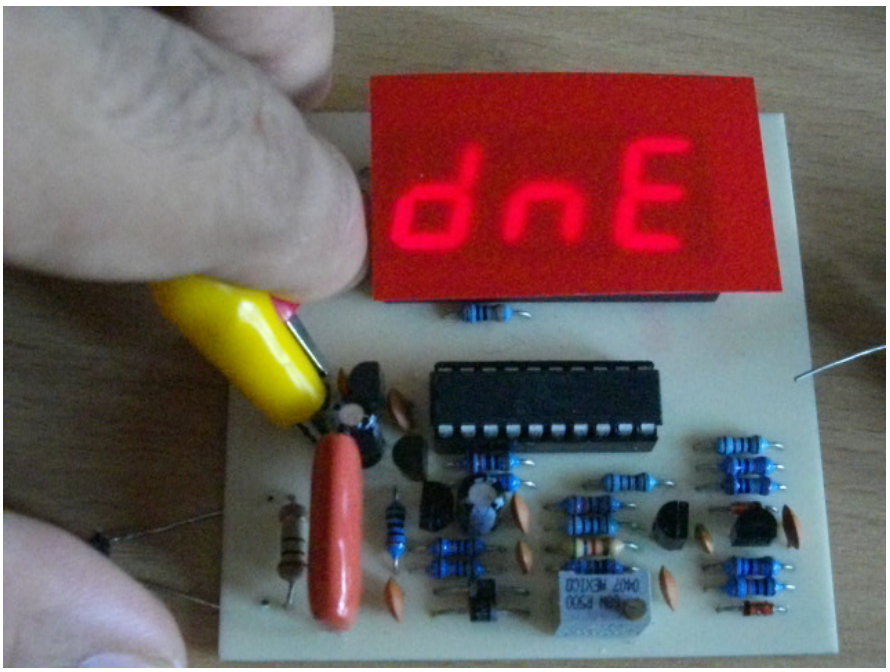


Remove the short and connect the 10 ohm resistor, adjust the trimmer so that the ADC will display 0x4CF:



Check the 0 ohm to make sure it is still zero, repeat this process until you get a stable 0x4CF reading for the 10 ohms resistor.

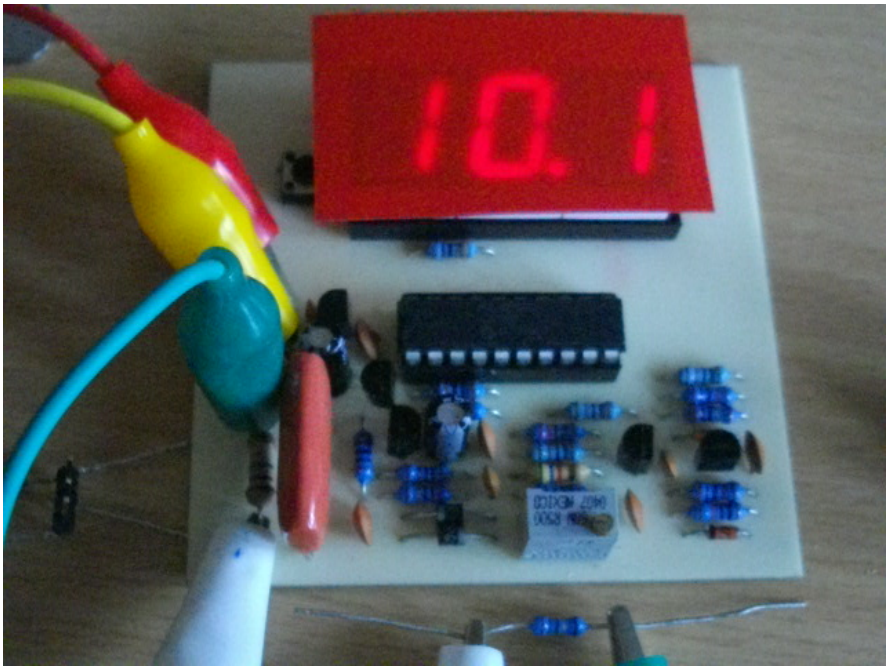
Once you are satisfied with the trimmer adjustment, press and hold the button until the "dnE" is displayed:



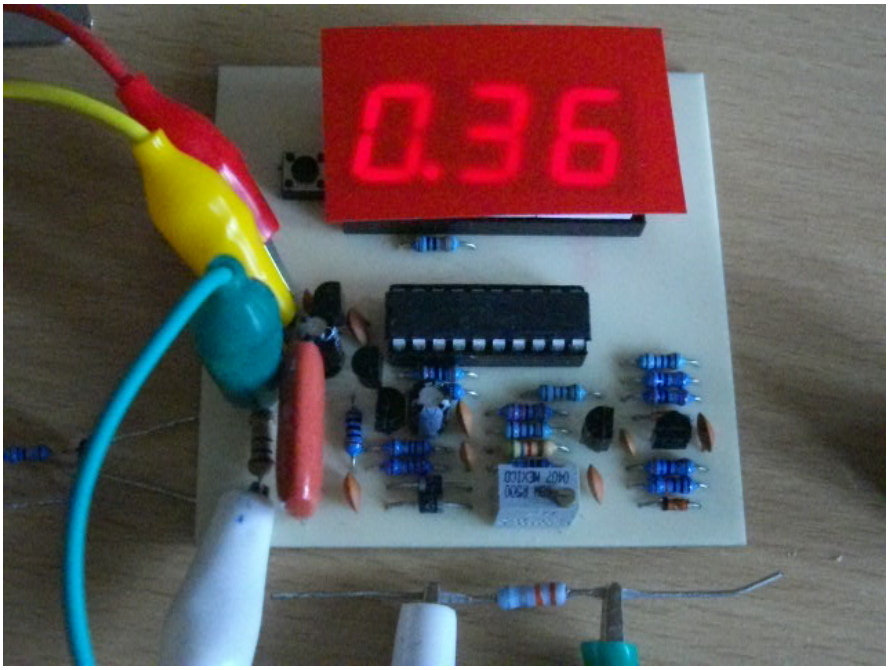
The meter is now ready to use.

RESULTS

10 ohm resistor:



0.33 ohm resistor:



NOTES

The calibration procedure can be accessed by holding the button when power is applied. Release the button and the display will stop blinking. Press and hold the button again to continue. If the button is not held for ~2 s it will jump to measurement mode, this is to prevent entering calibration mode by mistake.

This simple calibration will provide good results within 0-10 ohms range. Above 10 ohms, the accuracy is not good due to the non-linear nature of the calibration curve:

X-axis is ADC counts, Y-axis is ESR*100

The unit can measure up to 150 ohms with good accuracy but you have to manually create/update the calibration values in the source code.