

Prerequisites

You will need:

A way to power the meter while the back (containing the battery) is open. You can solder temporarily wires to the round pads (see Figure 1) or construct a gadget that can contact the square pads and is held with rubber bands (which is what I show in my video)

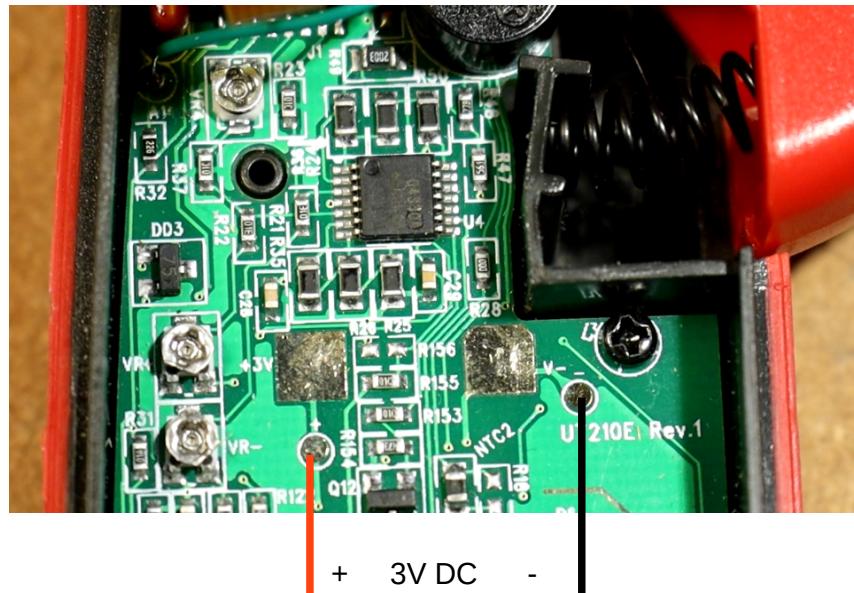


Figure 1: Powering the meter

A holder to be able to do repeated measurements with the meter held in exactly the same orientation with respect to the earth magnetic field.



Figure 2: A holder made of scrap wood



Figure 3: UT210E mounted on the holder (the rubber bands hold the power connector)

A compass rose drawn on a piece of paper and fixed on a desk aligned with magnetic North-South (you need a compass needle for that). Make sure the area is free of large iron items, power cables or magnets that can distort the magnetic field.

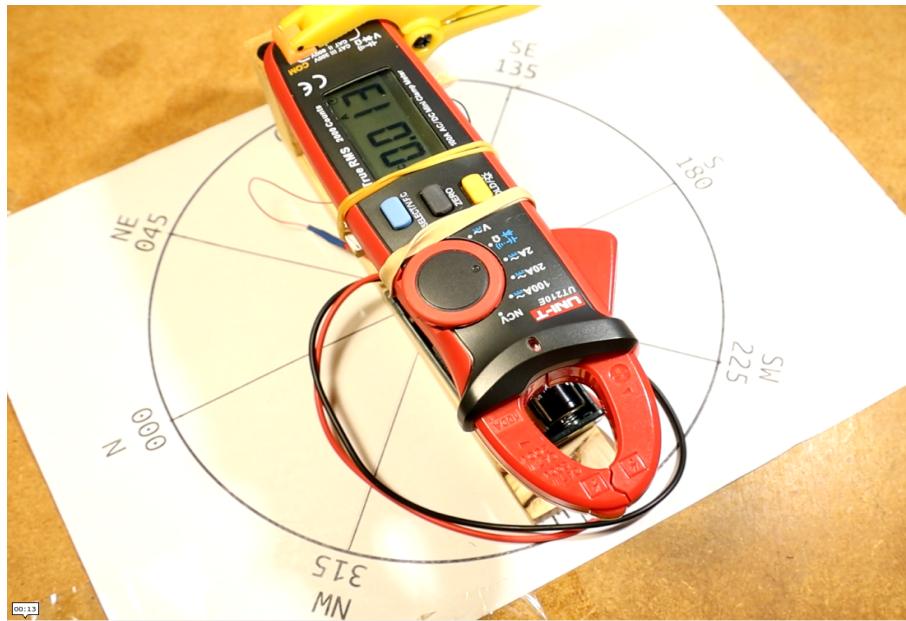


Figure 4: Compass rose with UT210E

Long procedure

1. Put meter on marked compass (direction is where jaws are pointing)
2. Rotate meter from N to E to S to W (accurately!) and take 4 readings
3. Rotate meter back from W to S to E to N (accurately!) and check readings against step 2.
4. If readings differ by more than +/- 1 go back to 2. You need a set of 4 stable numbers.
5. Find maximum and minimum of the 4 readings and calculate delta = max - min.
6. Note down the 4 readings and absolute value of delta (use a spreadsheet if possible!)
7. turn meter off and turn over (display side down)
8. adjust VR4 a tiny bit. Always go in the same direction
9. turn meter over again (display side up), turn power on and go back to DC amps
10. repeat from step 1 to collect a few data points
11. Examine the deltas of the data records

If it is continuously rising, VR4 is adjusted in the wrong direction. Continue collecting data points but now in step 8 adjust VR4 in the opposite direction.

If the delta has not much variation (+/- 5), continue collecting data points and adjusting VR4 in the same direction

If it is continuously falling, VR4 is adjusted in the correct direction. Continue collecting data points and do not change the direction of VR4 adjustments

If it was falling and is now rising, you may have passed the optimum position of VR4, collect a few more data points keeping same adjustment direction of VR4 just to be sure. If you are sure then continue with step 12

12. Examine the collected data. Find which record had the lowest delta. Pick one of the recorded orientations and associated value of this record
13. Orient the meter with the jaws pointing to the chosen direction. Adjust VR4 from below until you get close to that previously recorded value
14. Confirm the adjustment by collecting a set of readings as in 1..6 above.
15. If you are close to the lowest delta, you may stop and go to 16, otherwise you may try to optimize VR4 further by adjusting it by tiny(!) amounts in either direction but this is tricky.
16. Turn meter off and on and switch back to DC amps
17. Get a set of readings as in 1..6 above
18. Orient the meter in the direction that corresponds to the max/min values. If that was for example N-S, jaws should point either N or S
19. With the meter held so that display is on top, adjust either VR+ or VR- from below so that the offset readings are roughly equal on either side of zero.

20. Turn meter off, reassemble and check that all is working

Notes

Steps 1..10 measurements go here:

A	B	C	D	E	F	G	H	I	J	K
Measurement Number	North	East	South	West Calculation						
1	0	-54	-25	270	=min(b3:e3)	=max(b3:e3)	=abs(g3-f3)			
2	-85	96	104	-52	-85	-25	60			
3	48	105	111	55	48	104	56			
4	57	111	120	63	57	111	54			
5	63	158	157	102	102	158	56			
6	103	162	161	105	105	162	57			
7	109	122	176	175	117	117	176	59		
8	122	150	207	199	139	139	207	68		
9	150	173	235	226	162	162	235	73		
10	173	195	261	246	180	180	261	81		
11	195	205	217	209	156	158	217	61		
12	205	217	229	227	156	158	229	76		
13	217	229	242	232	156	158	232	84		
14	229	242	250	250	156	158	250	54 final VR4 setting		
15	242	250	314	319	156	158	314	54 change after pausing for 1h (no adjustments)		
16	250	314	319	319	156	158	319			
17	314	319	319	319	156	158	319			
18	319	319	319	319	156	158	319			
19	319	319	319	319	156	158	319			

Figure 5: Spreadsheet with example