DMM OPERATOR'S MANUAL

1.Overview

The multimeter A830L&A830C are characterized at slim size, podable, stable performance and anti-dropping oapacity. Using 3½ digits LCD monitor with character 15MM high, they offer clear readings. With overall circuilry design centering on large-scale IC A/D converlers in conjunction and over-load protection circuit, the meters give excel!ent pedormance and exquisite making as a handy utility instrument.
The meters can be used te measure DC & AC voltage. DC current, resistance, temperature (only HM~838L), positive diode voltage fall, hFE parameters for transistor and Continuity.

2.Panel Layout



① LCD Display: 3½ digits, character 15MM high
② Back Light Button Swilch: Press this button to switch on back light If the dark circumstance iight makes the reading difficulty when measudng, the light will be automatically turned off in 5 seconds.Press again to switch it on again. If the battery is in weak power, the light will be dimmed.
③ Triode ampLifier
④ Rotary Switch: use this switch to select functions and ranges
⑤ V Ω mA Inpul Jack
⑥ COM Input Jack
⑦ 10A Input Jack

3.Safely Information

3-1 The meters. are designed according to IEC-1010 concerning electronic measuring instruments with an over-voltage category (CAT II) and pollution 2.
3-2 Follow all safety and opemting instructions to ensure that the meter is used safely and is kept in good operating condition.
3-3 safety symbols:
⚠ impodant safety information, refer to the operating manual.
⚠ Danqerous voltage may be presence.
⧈ Double insulalion(protection ClassII)

4.Special Cautions for Operation

4-1 The meters can be safe only according to standard procedures when used in conjunctions with the supplied test leads. To replace damaged test leads with only the same model or same electric specifications.
4-2 To aveid risk of electric shock, do not use the meters befoie the cover is in place.
4-3 The range switch should be at right position for the testing.
4-4 To avoid electric shock and damaging the instruments, the input signals are forbidden to exceed Ihe specified limits.
4-5 When measuring TV set or switched power, attention should be paid to the possible pulses thal may bring destruction to the circuit.
4-6 Range switch position is forbidden to be changed at random during measurement.
4-7 Take caution against. shock in the course ot measuring voltage higher than DC 60V & AC 30V.
4-8 Protection fuse should be replacffd only with same type and same specification.

5.GENERAL SPECIFICATIONS

5-1 Max Voltage between input lerminal and Eaith Ground: CAT II 600V
5-2 Over-mnge Indication: display "1" for the significant digit.
5-3 Automatic display of negatiye poiarity"–".
5-4 Low Battery Indication: '⊟+' displayed
5-5 Max LCD display: 1999 (31/2 digits)
5-6 Fuse protection: F-200mA/250V(O5x20MM)
5-7 Power Supply: 9V battery, 6F22 or NEDA 1604
5-8 Operating Temp.: 0℃ to 40℃ (relative humidity <85%)
5-9 Storage Temp.:-10℃ to 50℃ ((relative humidity <85%)
5-10 Guaranteed precision Temp.:23 ± 5 ℃
(relative humidity <85%)
5-11Dimension: 69x138x31MM (with holster)
5-12 Weight: approx.170g (including baffery)

6.Testing Specifications

Accuracy is specified for a period of year after calibration and at 18℃ to 28 ℃ (64 F to 82°F) with relative humidity to 75%.

6-1 DC Voltage

Range	Rsolution	Accuracy
200mV	0.1mV	±(0.5% of rdg + 2 digits)
2V	1mV	
20V	10mV	
200V	100mV	±(0.8% of rdg + 3 digits)
600V	1V	

-- Input Impendence: 10MΩ
-- Overload protection: 250V for 200mV range, effeclive DC or AC 600V for other ranges

6-2 AC Voltage

Range	Rsolution	Accuracy
200mV	100uV	±(1.0% of rdg + 10 digits)
2V	1mV	
20V	10mV	
200V	100mV	±(1.2% of rdg + 10 digits)
600V	1V	

-- Frequency Range: 40 to 400Hz
-- Response: average, calibrated in rms of sinewave

6-3 DC Current

Range	Resolution	Accuracy
200uA	0.1uA	±(1.0% of rdg + 2 digits)
2mA	1uA	
20mA	10uA	
200mA	100uA	±(1.5% of rdg + 2 digits)
2A	1mA	±(3.0% of rdg + 2 digits)
10A	10mA	

-- Overload protection: F 200mA/250V fuse
Note:
10A range: not fused

6-4 Resistance

Range	Resolution	Accuracy
200Ω	0.1Ω	±(0.8% of rdg + 3 digits)
2KΩ	1Ω	
20KΩ	10Ω	
200KΩ	100Ω	
2MΩ	1KΩ	±(1.0% of rdg + 3 digits)
20MΩ	10KΩ	±(1.5% of rdg + 3 digits)

-- over-load protection: 250V effective value

6-5 Transistor hFE Test

Range	Test Range	Test Current / voltage
NPN & PNP	0-1000	I_b=10uA/Vce=3V

6-6 Diode Test

Range	Resolution	Function
⊣◁	1mV	Display: read approximate forward voltage of diode

-- over-load Protection: 250V effective value
-- forward DC current: approximate 1mA
-- Reversed DC voltage: approximate 3.0V

6-7 Contlinuity

Range	Function
•ıl)	Built-in buzzer wikll sound if resistance is less than 50Ω

-- over-load protection:250V effective value
-- open circuit voltage: approximate 3.0V

6-8 Batty Test

Range	Resolution	Accuracy	Remark
1.5V	41.1mA	±(1.8%of rdg + 2 digits)	A830L
1.5V	1.5V	±(1.3%of rdg + 2 digits)	A930B
3V	3V		
9V	9V		
24V	24V		

7.OPERATING INSTRUCTIONS

7-1 Attention before operation

7-1-1 Check 7V banery. if the battery voltage is less than 7V, display will show"⊟+", the battery should be replaced at this time to ensure measuring precision.
7-1-2 Pay attention to Ihe "⚠ "besides the input iack which shows that the input voltage or curren!should be within{he specified value.
7-1-3 The range switch should be positioned to desired range for measurement before operation.

7-2 Measuring DC Voltage

7-2-1 Connect the black test lead to COM jack and the red to V Ω mA jack.
7-2-2 Set the rotary switch at the desired V== range position.
7-2-3 Connect testleads across the source or load undel. measurement.
7-2-4 You can get reading from LCD. The poladty of the red lead connection will be indicated along with the voltage value.
NOTE:
1. When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
2. When only the figure'1' or ' -1' is displayed, it indicates over-range situation and!he higher range has to be selected.
3. "⚠" means you can,' input the vo!lage more than 600V, it's possible to show higher voltage, but it may destroy the inner circuit orpose a shock.
4. Be cautious against shock when measuring high Voltage.

7-3 Measuring AC Voltage

7-3-1 Connect the black test iead to COM jack and the red to V Ω mA jack.
7-3-2 Set the rotary switch at the desired V= range position.
7-3-3 Connect test leads across the source or load under measurement.
7-3-4 You can get reading Irom LCD.
NOTE:
1. When 1he value scale to be measured is unknown beforehand, set the range selector at the highest position.
2. When only Ihe figure'1' or ' -1' is displayed, it indicates over-range situation and the higher range has to be selected.
3. "⚠" means you can. input the voltage more than 600V, it's possible to show higher voltage, bul it may destroy the inner circuit or pose a shock.
4. Be cautious againsl shock when measuring high Vollage.

7-4 Measuring DC Current

7-4-1 Connect the black test lead to COM jack and the red to the V Ω mA jack for a maximum 200mA current , for a maximum 10A current, move Ihe red lead to the 10A jack.
7-4-2 Set the rotary switch at the desired A== range position.
7-4-3 Connect test leads in series with the load under measurement.
7-4-4 You can get reading from LCD. The polarity of the red iead connection will be indicated along with the current value.
NOTE:
1. When the value scale to be measured is unknown beforehand, sel the range selector at the highest position.
2. When only the figufe' P' 0r L' is displayed, it indicates over-range situation and the higher range has to be selected.
3. "⚠" means the socket mA's maximum curren! is 200mA and 10A's maximum current is 10A, over current will destroy the fuse. Since 10 A not fused, the measuring time should be less than 1 second to prevent precision from affecting by circuit heating.

7-5 Measuring Resistance

7-5-1 Connect the black test lead to COM jack and tile red to V Ω mA jack.
7-5-2 Set the rotary switch at the desired Ω range position.
7-5-3 Connect test leads across the resistance under measurement.
7-5-4 You can get reading from LCD.
NOTE:
1. When only ihe figure'1' or '-1' is displayed, it indicates over-range situation and the higher range has to be selected.
2. For measuring resistance above 1MΩ, the mete may take a few seconds to get stable reading.
3. When the input is not connected, i.e. At open circuit, the figure '1' will be displayed for the over-range condition.
4. When checkiflg in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.
5. the value scale to be measumd is unknown beforehand,set tile range selecfor at the highest position.

7-6 Measuring Temperature

7-6-1 Set the rotary switch at the ℃ range posffion.
7-6-2 The LCD will sow the current temperature of the environment.
7-6-3 When measuring temperature with thermocouple, temperature probe for this meter can be used. Insen .K. Type thermocouple probe(red one into V Ω mA jack and black one into COM jack)
7-6-4 You can get a reading from LCD.

7-7 Transistor Testing

7-7-1 Sot the rotary switch at, hFE, position.
7-7-2 Derermine whether the transistor under lesting is NPN or PNP and locale the emitter, base and collector leads. Insed the leads into proper holes of hFE socket on the fronl panel.
7-7-3 Read the approximate hFE value at Ihe testing condition of base current Ib 10uA and Vce 3V.

7-8 Diode Testing

7-8-1 Connect the black test lead to COM jack and the red to V Ω mA jack. (the polarity of red lead is'+')
7-8-2 Set the rotary switch at!he ⊣◁ E range position.
7-8-3 Connect the red lead to the anode and Ihe black lead to the cathode of the diode under testing.
7-8-4 You can get a reading from LCD.
NOTE:
1. The meter will show approximate forward voltage drop of the diode.
2. If the lead connections is reversed, only '1' will be displayed.

7-9 Continuity Testing

7-9-1 Connect the black. lesl lead to COM jack and the red to V Ω mA jack.
7-9-2 Set the rotary switch at the •ıl) range position.
7-9-3 Connect test leads across two points of the circuit under testing.
7-9-4 If continuity exists(I.e. resistance less than about 50 Ω), built-in buzzer will sound.
NOTE:
If the input open circuit, the figure '1' will be displayed.

8.Maintenance

8-1 Before attempting to remove the battery door or open the case, be sure that test leads have been disconnected from measurement circuit top avoid electric shock hazard.
8-2 To avoid electfical shock, temove test leads from measurement circuits before replacing the fuse. For protection against fire. Replace fuses only with specified ratings: F-200mA/250V fuse.
8-3 Your must replace the test leads if the lead is exposed, and should adopt the leads with the same specifications as origin.
8-4 Use only moisl fabric or sinall amount of detergent but not chemical solution for cleaning.
8-5 do not use the meter before the back cover is properly closed and screw secured. Upon any abnormality, stop operation immediately and send the meter for maintenance.

9.Accessories

[1] Tesl Leads: electric rating 1000V 10A
[2] Bauery: 9V, 6F22 or NEDA I 604
[3] Fuse: F-200mA/250V
[4] 'K' type Thermocouple(onlyA930C)
[5] Operators Manual
[6][HolSler