

# A901,A902

## 3 1/2 AUTO RANGE & AUTO POWER OFF AC CLAMP DIGITAL MULTIMETER OPERATION MANUAL

This LCD Auto Range & Auto Power off AC clamp digital multimeter is a portable, compact, 3 1/2 digits multimeter. It is ideally suited for field, lab, shop, car, and home applications.

## 1. SPECIFICATIONS

### 1.1 GENERAL SPECIFICATIONS

Display : 3 1/2 digits LCD with a max. reading of 1999.

Range control : Auto range control.

Polarity : Automatic negative polarity indication.

Zero adjustment : Automatic.

Overrange indication : The "OL" display.

Lowbattery : The "E" symbol is display when the battery is weak.

Auto Power Off: 15 minutes after stopping the switch or no key-input past, the meter automatically enters to power off mode.

Safety standards : **CE EMC/LVD**. The meter is up to the standards of IEC1010 Pollution Degree 2, Overvoltage Category II.

Operating environment: Temperature 32 to 104°F (0°C to 40°C), humidity < 85% RH.

Storage environment : Temperature -4 to 140°F (-20°C to 60°C), humidity < 95%RH.

Power : 2 x 1.5V AAA batteries.

Dimension : 197.5(H) x 76 (W) x 30(D) mm

Weight : Approx. 215g (including battery)

### 1.2 ELECTRICAL SPECIFICATIONS

Accuracy is  $\pm$  (% of reading + number in last digit) at 23  $\pm$  5°C, <75% RH.

#### DC Voltage

200mV, 2V, 20V, 200V, 600V :  $\pm$  (0.8% + 3)

Socket to earth is 300V  $\sqrt{\text{~}}$ .

Impedance : 10M $\Omega$

#### AC Voltage

2V, 20V, 200V:  $\pm$  (1.0% + 3)

600V :  $\pm$  (1.2% + 5)

Impedance : 10M $\Omega$ .

Frequency response: 40—400Hz

(40—100Hz on 600V range)

#### Resistance

200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$ :  $\pm$  (1% + 2)

20M $\Omega$ :  $\pm$  (2% + 3)

Overload protection : 250V DC/ACrms.

#### AC Current

2A, 20A :  $\pm$  (2.0% + 5)

200A, 600A :  $\pm$  (2.5% + 5)

Overload protection: 600Arms within 60 seconds.

### Diode Test

Test current: 1 $\pm$ 0.6mA

Test voltage : Approx. 1.5V

Overload protection : 250V DC/ACrms

### Continuity Test

Audible indication: less than 70 $\Omega$  $\pm$ 30 $\Omega$  Approx.

Overload protection: 250V DC/ACrms.

**TEMPERATURE**(Using K type thermocouple probe)

0°C-->+40°C :  $\pm$ 3°C (Use build-in temperature sensor

when short "COM" and "V $\Omega$ T")

-20°C-->+150°C:  $\pm$  (3°C+1)

+150°C-->+800°C :  $\pm$  (3%+1)

$^{\circ}$ F = 1.8 $\times$   $^{\circ}$ C + 32

Overload protection: 50V DC/ACrms

## 2. OPERATION

### WARNING

- 1) When measuring voltage ensure that instrument is not connected or switched to resistance range. Always ensure that the correct terminals are used for the type of measurement to be made.
- 2) Use extreme care when measuring voltage above 50V, especially from sources where high energy is existed.
- 3) Avoid making connections to "live" circuits whenever possible.
- 4) Before making resistance measurements or diode test, ensure that the circuit under test is de -- energized.
- 5) Always ensure that the correct function and range is selected.
- 6) Extreme care should be taken when using the instrument to conjunction with a current transformer connected to the terminals if an open circuit occurs.
- 7) Ensure that the test leads and probes are in good condition with no damage to the insulation.
- 8) Take care not to exceed the over-load limits as given in the specifications.
- 9) Before opening the cover of the battery cabinet to replace batteries, disconnect the test leads from any external circuit, set the selector switch to "**OFF**" position.
- 10) Keep the fingers after the protection ring when measuring through the instrument lead.

### 2.1 Check the 1.5-volt battery.

If the battery is weak, a "E" symbol will appear on the right of the display. It means that the battery should be replaced.

### 2.2 DC and AC Voltage measurement

- 1) Connect the black test lead to "**COM**" socket and red test leads to the "**V $\Omega$ T**" socket.
- 2) Set the selector switch to desired "**V $\sqrt{\text{~}}$** " position.
- 3) Press "**SEL**" key to choose DC or AC voltage measurement.
- 4) Connect the probes across the source or load under measurement.

### 2.3 AC Current measurement

- 1) Set the selector switch to desired "2A/20A~" or "20A/200A~" position.
- 2) Open the clamp by pressing the jaw-opening handle and insert the cable (one cable only) to be measured into the jaw.
- 3) Close the clamp and get the reading from the LCD panel.

**Note:**

- a) Before this measurement, disconnect the test lead with the meter for safety.
- b) In some occasion that the reading is hard to read, press the "DH" key and read the result later.

## 2.4 Resistance measurement

- 1) Connect the black test lead to "COM" socket and red test leads to the "VΩT" socket.
- 2) Set the selector switch to "Ω" position.
- 3) Connect the probes across circuit to be tested.

Caution: Ensure that the circuit to be tested is "dead".

Max. input over-load: 250V RMS. and <10sec.

**Note:**

Under the Low Resistance Range, the Users are requested to short the meter probes to get the resistance of test leads, which is needed to deduct from this measurement.

## 2.5 Diode, continuity test

- 1) Connect the black test lead to "COM" socket and red test leads to the "VΩT" socket.
- 2) Set the selector switch to "▶•🔊" position and press "SEL" key to choose function.
- 3) Connect the probes across circuit to be tested.

Caution: Ensure that the circuit to be tested is "dead".

Max. input over-load: 250V RMS. and <10sec.

## 2.6 Temperature measurement

- 1) Set the selector switch to the "°F/°C" position and connect the K type thermocouple's black test lead to "COM" socket and red test lead to the "VΩT" socket.
- 2) Press "SEL" key to choose °C or °F function.
- 3) Put the sensor probe into the temperature field under measurement.

## 2.7 Auto Power Off

When the meter has been turned on 15 minutes without any action from the users, the meter will automatically change to "OFF" mode.

## 2.8 Manual range and auto range

- 1) Default is set to be "Auto" range when the meter first turns on. Press "RAN" key the meter enter the "Manual" mode. Each presses of "RAN" key increments the range.
- 2) Press "RAN" key more than 2 seconds, the meter changes back to "Auto".

## 2.9 Data Hold

Press "DH" button meter enter data hold mode and press this button again the meter exit hold mode.

## 2.10 MAX Hold

Press "MH" button meter enter max data hold mode and press this button again the meter exit max data hold mode, when the function MAX HOLD is active, however the display value is the maximum reading during the whole measurement procedure.

# 3.CARE AND MAINTENANCE

## 3.1 CARING FOR YOUR MULTIMETER

Your Digital MultiMate is an example of superior design and craftsmanship. The following suggestions will help you care for the multimeter so you can enjoy it for years.

- 1) Keep the multimeter dry. If it gets wet, wipe it dry immediately. Liquids can contain minerals that can corrode electronic circuits.
- 2) Use and store the multimeter only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries, and distort or melt plastic parts.
- 3) Handle the multimeter gently and carefully. Dropping it can damage the circuit boards and case and can cause the multimeter to work improperly although the holster can provide enough protection.
- 4) Keep the multimeter away from dust and dirt, which can cause premature wear of parts.
- 5) Wipe the multimeter with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the multimeter.
- 6) Use only fresh batteries of the required size and type. Always remove old or weak batteries. They can leak chemicals that destroy electronic circuits.