

# Digital Multimeter User Manual

## Specification

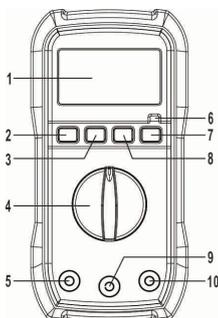
Max. Display	4000
DC Voltage	0.01mV~600V
AC Voltage	0.01mV~600V
DC Current	0.1uA~10A
AC Current	0.1uA~10A
Resistance	0.1Ω~40MΩ
Capacitance	10pF~40mF
Frequency	1Hz~10MHz
°C	x
°F	x
	✓
	✓
True RMS	✓
Backlight	✓
NCV	✓
Live Wire	✓
Data Hold	✓
MIN/MAX	✓
Relative	✓
Unit Display	✓
Auto Power off	✓
Range Mode	Auto Range
Battery	1.5Vx2

## Introduction

This multimeter have been designed as a higher stable, higher reliable, anti-fall arrest compact size digital multimeter, and with excellent accurate A/D converter as the core for large scale integrated circuit to ensure this model to measure AC/DC Voltage, AC/DC current, Resistance, Capacitance, Frequency, Diode Test, Continuity and Temperature, NCV and Live Wire test. With inbuilt backlight to realize read the values in dark environment. To fully utilize this meter, please keep this manual for reference carefully.

## Panel Description

- 1) LCD display: font height 20mm LCD
- 2) SEL Key: To shift more than two functions, such as AC/DC Voltage, AC/DC current, Diode, Continuity and Resistance, °F and °C, NCV and Live Wire
- 3) MAX/MIN Key
- 4) Function Selection Key
- 5) 10A Jack
- 6) NCV Indicator
- 7) H Key: Data Hold
- 8) Backlight Key: Hold and press to activate backlight, press again to exit.
- 8) REL Key
- 9) COM Jack
- 10) VΩmA Jack



## Safety

This range meters have been designed according to IEC1010 concerning electronic measuring instruments with 600V CAT III and pollution 2.

This symbol indicates that the operator must refer to an explanation in the

operating instruction to avoid personal injury or damage to the meter.

- Grounding
- High Voltage
- Double Insulation

## Cautions

- Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
- Always remove the test leads before replacing the battery or fuses.
- Inspect the condition of the test leads and the meter itself for any damage before operating the meter.
- Do not measure voltage if the voltage on the terminals exceeds 1000V above earth ground.
- Use great care when making measurements if the voltages are greater 30VAC RMS or 60V DC, these voltages are considered a shock hazard.
- Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
- To avoid damages to the meter, do not exceed the maximum limits of the input values shown in the specification.
- In case the device is going to be unused for an extended period of time, remove the batteries to prevent them from draining.

## Maintenance

- To avoid electric shock, disconnect the test leads from any source of voltage before removing the back cover or the battery or fuse covers.
- To avoid electric shock, do not operate the meter until the battery and fuse covers are in place and fastened securely.
- To protect circuit, replace the fuse must be in same specification.

## Technical Specifications

- \* Accuracy: ± (%readings + digit), warranty period: 12 months
- \* Environment temperature: 18°C~28°C; humidity: ≤80%
- \* Maximum between voltage input and grounding: CAT III 600V
- \* Fuse: F500mA/500V, F10A/500V
- \* Battery: 1.5V x 2

- \* Max display: 4000 count
- \* Overload display: "1" or "OL"
- \* Polarity display: negative "-"
- \* Operating temperature: 0°C-40°C
- \* Storage temperature: -10°C-50°C
- \* Low battery indication:
- \* Dimension: 147x74x46mm
- \* Weight: about 229g (include batteries)

## DC Voltage

Range	Resolution	Accuracy
40.00mV	0.01mV	±(0.5%+5)
400.0mV	0.1mV	±(0.5%+3)
4.000V	0.001V	±(0.8%+3)
40.00V	0.01V	±(0.8%+3)
400.0V	0.1V	±(0.8%+3)
600V	1V	±(1.0%+5)

Overload Protection: mV Range at 250V DC or 250V AC RMS, other ranges at 600V DC or 600V

## AC RMS

### DC Current

Range	Resolution	Accuracy
400.0μA	0.1μA	±(1.0%+5)
4000μA	1μA	±(1.0%+5)
40.00mA	0.01mA	±(1.0%+5)
400.0mA	0.1mA	±(2.0%+5)
4.000A	0.001A	±(2.5%+5)
10.00A	0.01A	±(2.5%+5)

Overload protection: fuse F500mA/500V; fuse F10A/500V

### AC Voltage

Range	Resolution	Accuracy
40.00mV	0.01mV	±(1.0%+20)
400.0mV	0.1mV	±(1.0%+10)
4.000V	0.001V	±(0.8%+3)
40.00V	0.01V	±(0.8%+3)
400.0V	0.1V	±(0.8%+3)
600V	1V	±(1.2%+5)

Overload Protection: mV Range at 250V DC or 250V AC RMS, other ranges at 600V DC or 600V

## AC RMS

Frequency range: 40Hz - 1000Hz

Display: True RMS

### AC Current

Range	Resolution	Accuracy
400.0μA	0.1μA	±(1.8%+3)
4000μA	1μA	±(1.5%+5)
40.00mA	0.01mA	±(1.5%+5)
400.0mA	0.1mA	±(2.5%+5)
4.000A	0.001A	±(3.0%+10)
10.00A	0.01A	±(3.0%+10)

Overload protection: fuse F500mA/500V; fuse F10A/500V

Frequency range: 40Hz - 1000Hz

### Resistance

Range	Resolution	Accuracy
400.0Ω	0.1Ω	±(1.2%+2)
4.000kΩ	0.001kΩ	±(1.0%+2)
40.00kΩ	0.01kΩ	±(1.0%+2)
400.0kΩ	0.1kΩ	±(1.0%+2)
4.000MΩ	0.001MΩ	±(1.0%+2)
40.00MΩ	0.01MΩ	±(1.2%+8)

Overload protection: 250V DC or 250V AC RMS

## Diode and Continuity

Range	Description
Buzzer	Built-in buzzer will be sounded if resistance is less than $50\Omega \pm 30\Omega$
Diode	Display approximate forward voltage of diode

Overload protection: 250V DC or 250V AC RMS

## Capacitance

Range	Resolution	Accuracy
40.00nF	10pF	$\pm(4.0\%+25)$
400.0nF~ 400.0uF	100pF~ 100nF	$\pm(4.0\%+15)$
4.000mF~ 40.00mF	1uF~ 10uF	$\pm(5.0\%+25)$

Overload protection: 250V DC or 250V AC RMS

## Frequency

Range	Resolution	Accuracy
4.000Hz~ 10.00MHz	0.001Hz~ 0.01MHz	$\pm(0.1\%+2)$

Overload protection: 250V DC or 250V AC RMS

## Operation Instruction

Note:

- \* Power on the meter and check the battery status, if  displays in LCD, please change the new batteries.
- \* To avoid damage to the meter, do not attempt to take any voltage or current exceed the rating values.
- \* Before the measurement, put the rotary switch to the desired range

## DC Voltage Measurement

1. Insert the red test lead into “VΩmA” jack and insert black test lead into “COM” jack.
2. Set the rotary switch to “V” or “mV” range, press SEL key to shift DC voltage mode, touch the test lead probe tips to the circuit under test, the red test lead connection will be displayed.

Note

- Risk of electrocution. High-voltage circuits, both AC and DC, are very dangerous and should be measured with great care.
- To avoid electrical shock and/or damage to the instrument, do not attempt to take any voltage measurement that might exceed 600VDC.
- Set the rotary switch to higher range if not known the current range under test, and then lower down till the best accuracy
- If display “1” or “OL” for over range, set the rotary switch to higher range

## DC Current Measurement

1. Insert black test lead into **COM** jack, for current measurement less than 400mA insert the red test lead into “VΩmA” jack, for current measurement between 400mA to 10A insert the red test lead into **10A** jack.
2. Set the rotary switch to the desired range and press SEL key to shift DC current mode, touch the test lead probe tips to the circuit under test, the red test lead connection

will be displayed.

Note

- To avoid damage to the meter, check the fuse of the meter before current measurement.
- Set the rotary switch to higher range if not known the current range under test, and then lower down till the best accuracy
- If display “1” or “OL” for over range, set the rotary switch to higher range
- To avoid damage to the meter, check the fuse of the meter before current measurement

## AC Voltage Measurement

1. Insert the red test lead into “VΩmA” jack and insert black test lead into “COM” jack.
2. Set the rotary switch to “V” or “mV” range, press SEL key to shift AC voltage mode, and then touch test leads to the circuit under test.

## AC Current Measurement

1. Insert black test lead into **COM** jack, for current measurement less than 400mA insert the red test lead into “VΩmA” jack, for current measurement between 400mA to 10A insert the red test lead into **10A** jack.
2. Set the rotary switch to the desired range and press SEL key to shift AC current mode, touch the test lead probe tips to the circuit under test, the red test lead connection will be displayed.

## Resistance Measurement

1. Insert black test lead into “COM” jack, and red test lead into “VΩmA” jack.
2. Set the rotary to Ω range and press SEL key to under-tested resistance and read the value from LCD.

Note

- In order to ensure the best accuracy in measurement of low resistance, short the test leads before the measurement and subtract this resistance value of the test leads.
- For high resistance measurement, the meter may take a few seconds to stabilize the readings.
- In the open circuit, the meter display **OL** to indicate the over range

## Diode Test

1. Insert black test lead into “COM” jack, and red test lead into “VΩmA” jack.
2. Set the rotary switch to  range, and press SEL to shift diode mode.

Place the red test lead on the anode of diode and black test lead on the cathode of diode, the meter will show the approx. forward voltage of diode.

## Continuity Check

1. Insert black test lead into “COM” jack, and red test lead into “VΩmA” jack.
2. Set the rotary switch to  range, and press SEL to shift  mode, touch the test leads to both points of circuit, if the

resistance between two points less than  $50\Omega \pm 30\Omega$ , the inbuilt buzzer will be sounded

## NCV Detection

1. Set the rotary switch to NCV range and press SEL to activate NCV mode, the LCD display “EF”.
2. Contact the top part of meter with the circuit under test, the indicating LED will flash and audible signal will sound.

Note

- \* The detection result is for reference, do not determine the voltage by NCV detection ONLY.
- \* Detection may interfere by socket design, insulation thickness and other variable conditions.
- \* The external interference sources, such as flashlight, motor, etc, may cause the wrong detection.

## Live Wire Identification

1. Set the rotary switch to “LIVE” range and press SEL to activate live wire identification mode, the LCD display “LIVE”.
2. Insert red test lead into “VΩmA” jack and place red test line tip to contact AC voltage. Once meter makes alarm sound and LCD shows “LIVE” icon, means the line under test is live wire

Note: When the circuit is in serious leakage (approx. over 15V), the red test lead even contact earth line, the buzzer of meter will be sounded and LED will be flickered.

## Battery and Fuse Replacement

Turn power off and disconnect the test leads from meter, remove the screws securing the rear cover to replace the same specification fuse

The replaced battery will be in same type as original battery.

After replace the fuse and battery, secure the rear cover.