

# UT801/802

## Operating Manual



Bench Type Digital Multimeters

### Overview

Digital Bench-Type Multimeter Model UT801 is the maximum reading 1999 and 3 1/2 digits and UT802 is the maximum reading 19999 and 4 1/2 digits, both models are in manual range, DC / AC current type digital multimeter, This is also the extra large characters in LCD display backlight with full function, full measurement and full overload protection as well as a good product design outlook, In addition to all the conventional features include DC/AC voltage, DC/AC current, resistance, frequency, capacitance, temperature  $^{\circ}\text{C}$ , Transistor hFE, diode and continuity buzzer.

This operating manual covers information on safety and cautions. Please read the relevant information carefully and observe all the Warnings and Notes strictly.

### Unpacking Inspection

Open the package case and take out the Meter. Check the following items carefully to see any missing or damaged part. If you find any missing or damage, please contact your dealer in your country.

- Operating Manual 1 piece
- Test Lead 1 pair
- Alligator Clip 1 pair
- K Type Temperature Probe 1 piece (For the temperature under 230 $^{\circ}\text{C}$  testing)
- Multi-Purpose Socket 1 piece
- Power Cord 1 piece (AC220V 50Hz DC9V/200mA)

### Safety Information

This Meter complies with the standards IEC61010-1 in pollution degree 2, overvoltage category (CAT II 1000V) and double insulation. If you can not follow up this operating instruction to use the meter and it reduces the chance to have an using protection.

1. Before using the Meter and Test Leads inspect both items. Do not use the Meter and Test Leads if it is damaged or the case (or part of the case) is removed or no reaction on LCD display. Prohibited to use the meter without housing or housing without screw fix up in order to avoid possible electric shock or to avoid possible damage to the meter or to the equipment under test.
2. If the damage of test leads, use only the same model number or identical electrical specifications replacement parts.
3. Do not use your finger to touch on any testing cable, connector, unused terminal input or circuit during the testing stage.
4. When the meter working at an effective voltage over 60V in DC or 30V rms in AC, special care should be taken for there is danger of electric shock.
5. Selecting the correct terminal input and turn the rotary switch to select the measuring function. In case of no any idea on the value input of the current, just simply test from the high value to low one.

6. Do not overload voltage or current on EITHER between terminal and terminal OR between terminal and grounding which indicate on meter limitation.
7. The rotary switch should be placed in the right position and no any changeover of range shall be made during measurement is conducted to prevent damage of the Meter.
8. Do not use or store the meter in an environment of high temperature, humidity, flammable and electromagnetic environment. The performance of the meter may deteriorate after dampened.
9. The internal circuit of the meter shall not be altered at will to avoid damage of the meter and any accident
10. Replace the battery as soon as the battery indicator " "Appears. With a low battery, the meter might produce false readings that can lead to electric shock and personal injury.
11. Turn the meter off when it is not is use and take out the battery when not using for a long time.

### General Specifications

1. Maximum Voltage between terminal input and COM: 1000V( except 200mV, 250V)
2.  $\mu\text{A}$  mA terminal input protection: (CE)250mA 265V auto recovery fuse
3. 10A terminal input protection: (CE)F1 (10A H 1000V) Fast type melted fuse  $\Phi$ 10.3x38mm
4. Resistance input protection: PTC/1000V
5. Capacitance input protection: (CE)F2, F3 (0.5A H 1000V) Fast type melted fuse  $\Phi$ 6.35x31.8mm
6. Frequency input protection: PTC/1000V
7. Temperature input protection: (CE)0.5A 1000V fuse
8. terminal input protection: PTC/1000V
9. hFE input protection: (CE)250mA 265V auto recovery fuse, F3 (0.5A H 1000V) Fast type melted fuse  $\Phi$ 6.35x31.8mm
10. Display: LCD full function signal display, maximum reading is 1999(UT801), 19999(UT802) Updates 2-3 times / second
11. Range: Manual
12. Polarity Display: Auto
13. Overload indication: 1
14. Battery Deficiency:
15. Operating Temperature: 0 $\sim$ 40 $^{\circ}\text{C}$  (32 $^{\circ}\text{F}$   $\sim$  104 $^{\circ}\text{F}$ )
16. Storing Temperature: -10 $\sim$ 50 $^{\circ}\text{C}$  (14 $^{\circ}\text{F}$   $\sim$  122 $^{\circ}\text{F}$ )
17. Relative Humidity: 0 $^{\circ}\text{C}$   $\sim$  30 $^{\circ}\text{C}$  below  $\leq$ 75%  
30 $^{\circ}\text{C}$   $\sim$  40 $^{\circ}\text{C}$   $\leq$ 50%
18. Electromagnetic Field: Under 1V/m the influence of radiated radio-frequency electromagnetic field phenomenon, Total accuracy= specific accuracy+ measurement 5%, Over 1V/m radiated radio-frequency electromagnetic which do not have any reference data on this topic.
19. Power: AC(external power adapter AC220V/DC9V-200mA) or DC(internal battery type 2 R14/1.5V 6 pieces)
20. Product size: (300x245x105)mm
21. Product Net Weight : About1500g(without the accessories)
22. Safety Compliances : IEC 61010: CAT II 1000V

### LCD Display

1. **Manual Range** Indicator of manual range
2. **Warning !** Indicator for Warning signal
3. The battery is low
4. Indicator for high voltage signal
5. Indicator for Negative reading display
6. **AC** Indicator for AC voltage or current ( DC indicator do not display)
7. Data hold is active
8. Test of diode
9. The continuity buzzer is on
10. **Number** Indicates testing reading
11. **Units of measurement:**

|                                    |                                                                 |
|------------------------------------|-----------------------------------------------------------------|
| mV, V                              | Unit of Voltage: The millivolt, volt                            |
| $\mu\text{A}$ , mA, A              | Unit of current: Microampere, milliampere, ampere               |
| $\Omega$ , k $\Omega$ , M $\Omega$ | Unit of electrical resistance: Ohm, thousand ohms, trillion ohm |
| nF/ $\mu\text{F}$                  | Unit of electrical capacity: Accepts the farad, the microfarad  |
| kHz                                | Unit of Frequency: Kiloherzt                                    |
| $^{\circ}\text{C}$                 | Unit of Temperature: Degree Celsius Factor                      |
| $\beta$                            | Unit of Triode enlargement: Times                               |

### Functions

| Symbol             | Terminal Input                         | Explanation                              |
|--------------------|----------------------------------------|------------------------------------------|
| V                  | V $\leftrightarrow$ COM                | DC Voltage Measurement                   |
| V                  | V $\leftrightarrow$ COM                | AC Voltage Measurement                   |
| $\Omega$           | V $\leftrightarrow$ COM                | Resistance Measurement                   |
|                    | V $\leftrightarrow$ COM                | Diode / Continuity Buzzer Measurement    |
| kHz                | V $\leftrightarrow$ COM                | Frequency Measurement                    |
| A $\leftarrow$     | mA $\mu\text{A}$ $\leftrightarrow$ COM | mA/ $\mu\text{A}$ DC Current Measurement |
|                    | 10A $\leftrightarrow$ COM              | ADC Current Measurement                  |
| A $\sim$           | mA $\mu\text{A}$ $\leftrightarrow$ COM | mA/ $\mu\text{A}$ AC Current Measurement |
|                    | 10A $\leftrightarrow$ COM              | A AC Current Measurement                 |
| F                  | V $\leftrightarrow$ mA $\mu\text{A}$   | Capacitance Measurement                  |
|                    | (Use Multi-Purpose Socket)             |                                          |
| $^{\circ}\text{C}$ | V $\leftrightarrow$ mA $\mu\text{A}$   | Temperature Measurement                  |
|                    | (Use Multi-Purpose Socket)             |                                          |
| hFE                | V $\leftrightarrow$ mA $\mu\text{A}$   | Triode Enlargement Factor Measurement    |
|                    | (Use Multi-Purpose Socket)             |                                          |

### Functional Buttons

|              |                                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | Turn the power on and off Turn the display backlight on and off(suitable for battery supply, backlight turn on about 10 seconds after auto shut down.) |
| <b>LIGHT</b> |                                                                                                                                                        |
| <b>HOLD</b>  | Press Hold to enter and exit the hold mode in any mode, the meter beeps.                                                                               |

### Operational Measurement Guide (see Diagram 1, 2, 3)

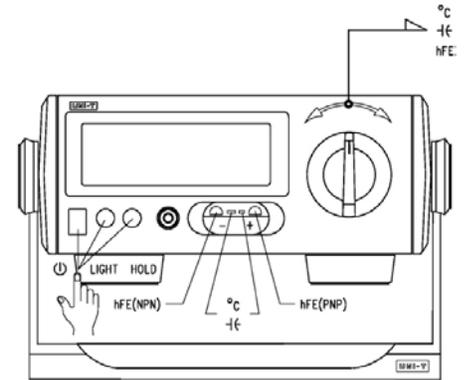


Diagram 1

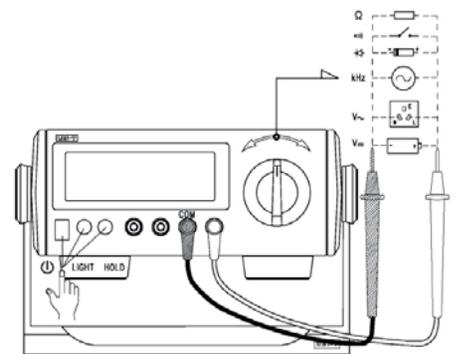


Diagram 2

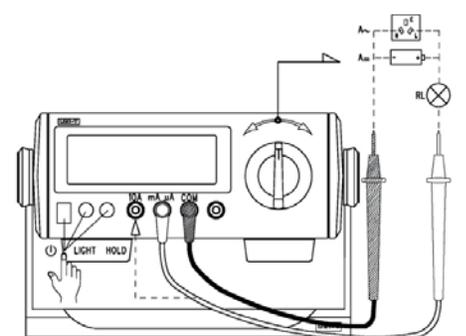


Diagram 3

**Warning:**

1. Selecting the correct terminal input and turns the rotary switch to select the measuring function. If fails to do that, the buzzer beep and the warning signal flash on.

| Range         | Alarm Alert On False Terminal Input |
|---------------|-------------------------------------|
| V Hz Ω        | 10A mAμA                            |
| mAμA °C hFE F | 10A                                 |
| 10A           | mAμA                                |

**2.DC or AC Voltage Measurement**

• To avoid harms to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 1000 V although reading may be obtained.

• The Meter has an input impedance of 10MΩ(except UT802/ACV input impedance of 2MΩ) This loading effect can cause measurement errors in high impedance circuits and so you need to take a note on it.

**3.DC or AC Current Measurement**

• Before connect the Meter in serial with the tested return circuit, closed the return circuit current to avoid the dangerous of sparking.

• Do not use over >10A current measurement. Although the meter can work on below 20A current testing but for the avoiding any harms to you or damages to the Meter.

**4.Measuring Resistance, Diodes, Continuity or Capacitance**

• To maintain the measurement accuracy, discount circuit power and discharge all the high voltage capacitors during the measuring resistance.

• When measuring high resistance on 1MΩ or above, it is normal to take several seconds to obtain a stable reading. In order to obtain stable reading, choose shorter test lead to carrying out measurement.

• The test leads and the Meter inside wire will bring around 0.1Ω~0.2Ω of error to resistance measurement when measuring low resistance. To obtain accurate readings in low-resistance, short -circuit the test leads beforehand and record the reading obtained, call this reading as X. Then use the equation: measured resistance value (Y) - (X) = accurate readings of resistance.

• During measurement, Diodes is in a good silicon junction drops between 500mV~800mV as the normal value. The continuity measurement, the poles between resistance is >100Ω, it is a short circuit, but on the poles between resistance is ≤10Ω, it is a good connection, buzzer is continually beep on, and the reading value is nearly to the circuit resistance value, Unit is Ω.

**Accuracy Specifications**

Accuracy: ±(% reading + digits), guarantee for 1 year  
 Operating temperature: 18°C~28°C  
 Environmental humidity: Less than 75%RH

**1. DC Voltage**

| Range | Resolution |        | Accuracy Tolerance:±(% Reading+Digits) |           |
|-------|------------|--------|----------------------------------------|-----------|
|       | UT801      | UT802  | UT801                                  | UT802     |
| 200mV | 0.1mV      | 0.01mV | ±(0.5%+2)                              | ±(0.1%+3) |
| 2V    | 1mV        | 0.1mV  |                                        |           |
| 20V   | 10mV       | 1mV    |                                        |           |
| 200V  | 100mV      | 10mV   | ±(0.8%+3)                              | ±(0.2%+5) |
| 1000V | 1V         | 0.1V   |                                        |           |

Input Impedance: is average on 10MΩ

Maximum Voltage Input: 1000V (Except 200mV, 250V)

**2. AC Voltage**

| Range | Resolution |       | Accuracy Tolerance:±(% Reading+Digits) |            |
|-------|------------|-------|----------------------------------------|------------|
|       | UT801      | UT802 | UT801                                  | UT802      |
| 2V    | 1mV        | 0.1mV | ±(0.8%+3)                              | ±(0.5%+20) |
| 20V   | 10mV       | 1mV   | ±(1.0%+4)                              | ±(0.8%+40) |
| 200V  | 100mV      | 10mV  |                                        |            |
| 1000V | 1V         | 0.1V  |                                        |            |

Input Impedance: UT801 is average on 10MΩ ,

UT802 is about 2MΩ .

Maximum Voltage Input: 1000 Vrms

Frequency: 45Hz~400Hz

Display: True RMS

**3. DC Current**

| Range | Resolution |        | Accuracy Tolerance:±(% Reading+Digits) |            |
|-------|------------|--------|----------------------------------------|------------|
|       | UT801      | UT802  | UT801                                  | UT802      |
| 200μA | 0.1μA      | 0.01μA | ±(0.8%+2)                              | ±(0.5%+20) |
| 2mA   | 1μA        | 0.1μA  |                                        |            |
| 20mA  | 10μA       | 1μA    |                                        |            |
| 200mA | 0.1mA      | 0.01mA | ±(2.0%+4)                              | ±(1.5%+40) |
| 10A   | 10mA       | 1mA    |                                        |            |

\* When ≥5A, Continuous measurement less than 10 seconds at an interval more than 15 minutes.

**4. AC Current**

| Range | Resolution |        | Accuracy Tolerance:±(% Reading+Digits) |            |
|-------|------------|--------|----------------------------------------|------------|
|       | UT801      | UT802  | UT801                                  | UT802      |
| 2mA   | 1μA        | 0.1μA  | ±(1.0%+3)                              | ±(0.8%+40) |
| 20mA  | 10μA       | 1μA    |                                        |            |
| 200mA | 0.1mA      | 0.01mA |                                        |            |
| 10A   | 10mA       | 1mA    | ±(2.5%+5)                              | ±(2.0%+40) |

Frequency: 45Hz~400Hz

\* When ≥5A, Continuous measurement less than 10 seconds at an interval more than 15 minutes.

**5. Resistance**

| Range | Resolution |       | Accuracy Tolerance:±(% Reading+Digits) |            |
|-------|------------|-------|----------------------------------------|------------|
|       | UT801      | UT802 | UT801                                  | UT802      |
| 200Ω  | 0.1Ω       | 0.01Ω | ±(0.8%+3)                              | ±(0.5%+10) |
| 2kΩ   | 1Ω         | 0.1Ω  |                                        |            |
| 20kΩ  | 10Ω        | 1Ω    |                                        |            |
| 200kΩ | 100Ω       | 10Ω   |                                        |            |
| 2MΩ   | 1kΩ        | 100Ω  |                                        |            |
| 20MΩ  | 10kΩ       |       | ±(1.5%+5)                              |            |
| 200MΩ |            | 10kΩ  |                                        | ±(5%+40)   |

When >100MΩ resistance measurement as reference purpose.

**6. Capacitance**

| Range  | Resolution |       | Accuracy Tolerance:±(% Reading+Digits) |          |
|--------|------------|-------|----------------------------------------|----------|
|        | UT801      | UT802 | UT801                                  | UT802    |
| 20nF   | 10pF       | 1pF   | ±(4%+3)                                | ±(4%+10) |
| 2μF    | 1nF        | 100pF |                                        |          |
| 200μF* | 100nF      | 10nF  | ±(5%+5)                                | ±5%+10)  |

\*>40μF capacitance measurement as reference purpose.

**7. Frequency**

| Range  | Resolution |       | Accuracy Tolerance:±(% Reading+Digits) |            |
|--------|------------|-------|----------------------------------------|------------|
|        | UT801      | UT802 | UT801                                  | UT802      |
| 2kHz   | 1Hz        | 0.1Hz | ±(1.5%+5)                              | ±(1.2%+10) |
| 200kHz | 100Hz      | 10Hz  |                                        |            |

Input Amplitude a:

(2kHz range) 50mV≤a≤30Vrms  
 (200kHz range)150mV≤a≤30Vrms

**8. Temperature**

| Range       | Resolution |       | Accuracy Tolerance:±(% Reading+Digits) |            |
|-------------|------------|-------|----------------------------------------|------------|
|             | UT801      | UT802 | UT801                                  | UT802      |
| -40~-20°C   | 1°C        | 0.1°C | -(8%+5)                                | -(8%+40)   |
| >-20°C0°C   |            |       | ±(1.2%+4)                              | ±(1.2%+30) |
| >0~-100°C   |            |       | ±(1.2%+3)                              | ±(1.2%+25) |
| >100~1000°C |            |       | ±(2.5%+2)                              | ±(2.5%+20) |

\* Thermocouple: It is suitable to use K type thermocouple. This include point contact K type thermocouple can only be used on less than 230°C temperature measurement.

**9. Diode Test**

| Range | Resolution |       | Remarks                                                                                          |
|-------|------------|-------|--------------------------------------------------------------------------------------------------|
| ➔     | UT801      | UT802 | Open circuit voltage is around 3 V, Silicon junction drops between 0.5~0.8V as the normal value. |
|       | 1mV        | 0.1mV |                                                                                                  |

**10. Continuity Test**

| Range | Resolution |       | Remarks                                |
|-------|------------|-------|----------------------------------------|
| • )   | UT801      | UT802 | Open circuit voltage is approximate 3V |
|       | 1Ω*        | 0.1Ω* |                                        |

When circuit disconnected with resistance value >100Ω, buzzer does not beep.

When circuit is in good connection with resistance value ≤10Ω, buzzer beeps continuously.

**11. Transistor hFE**

| Range | Resolution |       | Remarks                              |
|-------|------------|-------|--------------------------------------|
| hFE   | UT801      | UT802 | Ib0 is about 10μA, Vce is about 2.5V |
|       | 1β*        | 0.1β* |                                      |

**Replacing the battery(see Diagram 4)**

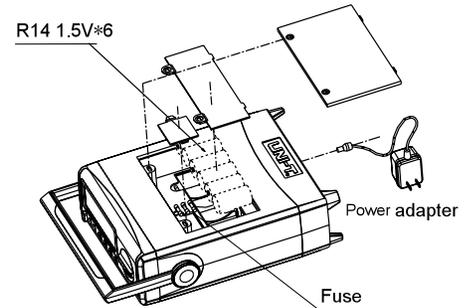


Diagram 4

Specifications and other information shown on this instruction manual are subject to change without notice

# 说明书菲林做货要求：

| 序号           | 项目                                                                                | 内容                                                                     |
|--------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------|
| 1            | 尺寸                                                                                | 外形尺寸：(210x285) ±1mm, 折叠成形尺寸(70x142.5) ±1mm:                            |
| 2            | 材质                                                                                | 用60g书纸                                                                 |
| 3            | 颜色                                                                                | 黑色                                                                     |
| 4            | 外观要求                                                                              | 印刷完整清晰, 版面整洁. 无分层. 残损. 毛边等缺陷.                                          |
| 5            | 装订方式                                                                              | 风琴折（三折），再中间对折，封面图在外面                                                   |
| 6            | 表面处理                                                                              | /                                                                      |
| 7            | 其它                                                                                | /                                                                      |
| 版本           |                                                                                   | REV.1 修改成股份有限公司                                                        |
| DWH<br>设计    | 黄荣伟2018.06.25                                                                     | MODEL<br>机型：UT801, UT802                                               |
| CHK<br>审核    |  | Part NO.<br>物料编号：110401104405X                                         |
| APPRO.<br>批准 |  | <b>UNI-T</b> 优利德科技(中国)股份有限公司<br>UNI-TREND TECHNOLOGY (CHINA) CO., LTD. |