

Smart Clamp Meter

Manual

1. SUMMARIZE

This instrument is a 9999 counts automatic range hand-held digital clamp meter. It has Bluetooth communication function, and it is stable, safe, and reliable. The product is designed to meet the requirements of safety regulations CAT III 600V, with full range overload protection and patent appearance design, it is a superior performance, easy to use intelligent testing instrument.

This meter can measure AC/DC voltage, AC current, low-pass filter voltage/current, surge current, peak voltage/current, continuity test, capacitance, non-contact AC voltage induction measurement ((NCV). At the same time, it has Bluetooth function, it can realize wireless data monitoring separate men from machines and instrument controlling by connecting mobile phone APP.

2. OPEN PACKING FOR CHECKING

Open the box, take out the meter, checking the items below, if there is anything missing or damaging, please contact with your supplier.

- 1.5V AAA battery LR03 2pcs
- Manual 1pc
- Test lead 1pair
- Carrying bag 1pc

Please contact with your supplier if you find out any problems

3. SAFETY NOTES

The meter's design is in accordance with the CE certification, IEC61010 related terms(Safety standard issued by the International Electrotechnical Commission or equivalent GB4793.1 requirement), in conformity with CAT III 600V and pollution class III safety standard. If you do not use the clamp meter in accordance with the relevant operating instructions, the protection provided by the clamp meter will be weakened or lost.

1. Check the clamp meter and test leads before use to prevent any damage or abnormal phenomenon. If you find test leads and housing insulation is obviously damaged, and the

LCD has no display, etc., or you think the clamp meter cannot work properly, please do not use it again.

2. Do not use clamp meter before the back cover and battery cover are not properly covered to avoid electric shock.


3. Remember that the fingers do not exceed the hand part of the test leads when measuring, do not contact exposed electricity wires, connectors, unused inputs or measuring circuits to prevent electric shock.

4. The function switch must be placed in the correct position before measurement. It is strictly forbidden to change range during measurement to prevent damage to the clamp meter.

5. Do not apply more than DC1000V/AC 600V voltage between the terminal of the clamp meter and the ground to avoid electric shock and damage to the clamp meter.

6. Be careful when measuring voltage which is higher than 36V DC or 25AC True RMS to avoid electric shock.

7. Use the clamp meter according to the instructions of manual, and it is forbidden to measure the voltage or current higher than the allowable input value. Before doing online resistance, capacitance, diode, or circuit continuity measurements, you must first cut off all power supplies in the circuit and discharge all capacitors to avoid the incorrect measurement results.







8. When the LCD displays the "  " sign, please replace the battery in time to ensure the measurement accuracy. When you not plan to use this clamp meter for a long time, you should remove the battery.

9. Do not change the internal wiring of the clamp meter to avoid damage of the instrument and hidden danger of the user.

10. Do not store or use the clamp meter in a high temperature, high humidity, flammable, explosive and strong electromagnetic field environment.

11. Use a soft cloth and neutral detergent to clean the shell of clamp meter. Do not use abrasive or solvent to avoid the shell is corroded, and damage to the meter and personal safety.

4. ELECTRIC SYMBOL

	Warning		DC
	High voltage damage		AC
	Ground		AC and DC

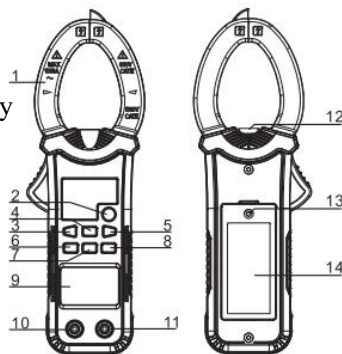
	Dual insulation		Accord with the order of European Union
	Low battery		Fuse

5. GENERAL SPECIFICATION

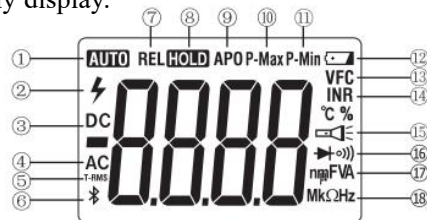
- 5.1. Max. Display: 9999, sampling rate 3 times / sec.
- 5.2. Polarity indication: The positive and negative polarities automatically display.
- 5.3. Over load indication: LCD displays OL
- 5.4. Low battery indication: “” symbol displays
- 5.5. Operation temperature: 0~40°C, relative humidity <75%
- 5.6. Storage environment:-10°C~50°C, relative humidity <80%RH;
- 5.7. Power: 2*1.5V AAA battery LR03
- 5.8. The Max. opening size of the clamp: Diameter 40mm
- 5.9. Max. measuring current wire: Diameter 39mm
- 5.10. Size: 219×75×34 mm
- 5.11. Weight: approx.240g (including batteries)

6. APPEARANCE STRUCTURE

1. Clamp jaw
2. Power switch button/Bluetooth button
3. Resistance/Continuity/diode/capacitance function key
4. AC voltage/AC voltage (low-pass filter)/ DC voltage function key
5. AC current/AC current ((low-pass filter)/ surge current key
6. Relative value measurement / Torch switch
7. Data hold /backlight key
8. on-contact AC voltage induction/peak hold key
9. LCD
10. COM terminal (connect black test lead)
11. Input terminal (connect red test lead)
12. Torch
13. Battery cover screw
14. Battery cover



7. DISPLAY SCREEN



①	Auto range	⑪	Minimum measurement
②	High voltage	⑫	Low battery
③	DC measurement	⑬	Low-pass filter measurement
④	AC measurement	⑭	Surge current measurement
⑤	True RMS value	⑮	Torch
⑥	Bluetooth	⑯	Diode, continuity test
⑦	Relative value measurement	⑰	Capacitance, voltage, current.
⑧	Data hold	⑱	Ohm, Kilo ohm, Mega ohm, Frequency
⑨	Auto shut-down		
⑩	Maximum measurement		

8. BUTTON FUNCTION

8. 1. POWER switch/Bluetooth key(Red key):

Short press this key to open/close the Bluetooth connection, long press this key to power on/off.

8. 2. REL/

Short press this key to open/close the relative value measurement
Long press this key to open/close the torch (Note that the flashlight will not turn off automatically after it is turned on. You should turn it off manually)

8. 3. HOLD/BL key:

Data hold: short press this key to enter or exit reading hold measurement data,
Long press this key to open/close backlight function

Automatic shutdown (APO)function: At the shutdown state, press first the HOLD key while turning the range switch. After the meter enters the normal measurement state, the automatic shutdown function can be canceled, and the "APO" symbol will no longer displayed on the LCD screen.

8. 4. NCV/PEAK key:

Press this key to open or close the NCV function.

Long press this key to enter or exit the AC signal peak capture function. after the peak capture function is close, short press to select between P-MAX and P-MIN function(valid

only for ACV and ACA).

8. 5. Orange key ()

Short press this key to switch resistance/continuity/diode/capacitor function measurement.

8. 6. Green key ()

Short press this key to switch ACV/ ACV-VFC /DCV function measurement.

8. 7. Blue Key ()

Short press this key to switch ACA/ACA-VFC function measurement.

Long press this key to open or close surge current measurement (valid for ACA only)

9. OPERATE INSTRUCTIONS

9. 1. AC current measurement

9. 1. 1. Press the blue key to switch ACA or ACA-VFC. function.

9. 1. 2. Press and hold the trigger to open the clamp head and use the clamp head to grab the measured conductor, then slowly release the trigger until the clamp head is completely closed. Read the True RMS of AC current directly from the display.

9. 1. 3. Long press the blue key at ACA current function to start the surge current function. At this time, start the electrical appliance and the instantaneous current of the electrical appliance can be measured. Long press the blue key again to exit the surge current measurement function.

9. 1. 4. At ACA function, long press the PEAK key to enter the AC signal peak capture function. Short press PEAK key to select between P-MAX and P-MIN, and long press PEAK key again to exit the peak capture function (peak capture function is only in the maximum range without displaying decimal).

 Note:

- The clamp meter can only measure one current conductor at a time. If two or more current conductors are measured at the same time, the measurement readings will be wrong.
- In order to ensure the accuracy of the measurement data, the measured conductor must be placed in the center of the clamp head. Otherwise, $\pm 1.0\%$ additional error of the reading will occur.
- The current measurement function must be operated between $0^{\circ}\text{C}\sim 40^{\circ}\text{C}$
- Hold the trigger and don't release it suddenly. The Hall element is a sensitive device, which is not only sensitive to magnetism, but also to thermal and mechanical stress in different degree, and impact will cause the reading to change in a short time.

10. AC /DC voltage measurement


10. 1. 1. Insert the red test lead into the " $V\Omega$ " jack and the black test lead into the COM jack. Short press the green key to switch ACA or ACA-VFC or DCV function, connect the red and black test lead in parallel to the measured power supply or load .

10. 1. 2. Read the True RMS of AC voltage directly from the display

10. 1. 3. At ACV function, long press PEAK key to enter the AC signal peak capture function. (Peak capture function is only in the maximum range without displaying decimal).

10. 1. 4. At low-pass filter (ACV-VFC) function, it can measure the frequency conversion signal generated by the inverter and frequency conversion motor.

 Note:

- Do not input voltage higher than DC600V/AC750V to avoid damage of the instrument.
- When measuring high voltage, pay special attention to avoid electric shock.
- Disconnect the test lead from the measured circuit after all measurement operations are completed.
- When the measured voltage is higher than 24V DC/AC safe voltage, the LCD of this meter displays the high-voltage prompt "  " for warning.
- When measuring voltage above 36V, pay attention to wear safety protection equipment.

10. 2. Resistance measurement

10. 2. 1. Short press orange key to switch resistance measurement function.

10. 2. 2. Connect the test lead wire to both ends of the measured resistance.

10. 2. 3. Read the measured resistance directly on the LCD.

 Note:

- If the tested resistor is under open circuit or the resistance of the measured resistor exceeds the maximum range of the meter, the display will show "OL"
- When measuring on-line resistance, all power supplies in the measured circuit must be turned off before the measurement, In order to ensure the measurement is correct.
- When measuring low resistance, the test leads will have about $0.1\ \Omega$ - $0.2\ \Omega$ measurement error. In order to obtain accurate readings, you can perform relative value measurement. First, subtract the short-circuit display value of the test lead, then perform low resistance measurement.

- d. If the resistance value is higher than 0.5Ω when the test leads are short-circuited, you need to check whether the test leads are loose or other reasons.
- e. When measuring resistance above $1M \Omega$, it may take a few seconds for the reading to stabilize. It is normal for high resistance measurements. In order to obtain stable readings, you can buy an extra short alligator clip test line instead of our standard test leads to do the measurement.
- f. Disconnect the test lead from the measured circuit after all measurement operations are completed.

10. 3. Diode and continuity test

- 10. 3. 1. Insert the red test lead into the " $V\Omega\ast$ " jack and the black test lead into the COM jack.
- 10. 3. 2. Short press orange key to switch diode or continuity measurement mode.
- 10. 3. 3. When under continuity test, if the resistance of the tested circuit is less than 50Ω , the built-in buzzer will sound.
- 10. 3. 4. In the diode measurement mode, connect the red test lead and black test lead to the positive and negative pole of the diode respectively, and the LCD will display the forward voltage drop of the diode.

 Note:

- a. If the open circuit or polarity of the measured diode is reversely connect, the display will show "OL".
- b. Do not input voltage higher than DC or AC 30V to avoid personal safety injury.
- c. All power supplies in the measured circuit must be turned off before the measurement, and all capacitors are released completely.
- d. Disconnect the test lead from the measured circuit after all measurement operations are completed.

10. 4. Capacitance measurement

- 10. 4. 1. Insert the red test lead into the " $V\Omega\ast$ " jack and the black test lead into the COM jack.
- 10. 4. 2. Short press orange key to switch the capacitance measurement.
- 10. 4. 3. Connect the test lead to both ends of the measured capacitor and confirm whether the polarity is correct.

Read the measured capacitance value directly from the LCD display.

 Note:

- a. If the tested capacitor is under open circuit or the capacitance of the measured

capacitor exceeds the maximum range of the meter, the display will show "OL"

- b. it is recommended to discharge all the residual charge of capacitors or capacitors in the circuit before the test. For capacitance larger than $400\mu F$, the measurement will take a long time. In order to ensure the accuracy
- c. You can use REL relative value measurement mode for capacitance measurement which can be used to subtract (clear) the base value of the open circuit and lead.

10. 5. Non-contact AC voltage induction measurement NCV

10. 5. 1. Short press NCV/ PEAK key to enter NCV measurement mode, and the LCD displays EF.

10. 5. 2. The NCV induction voltage range is $48V\sim 250V$. Put the upper part of the clamp head of the instrument close to the measured charged electric field (AC power line, socket, etc.), when the instrument sensing AC voltage electric field, the meter will display "----" and the buzzer issued "drop, drop" alarm sound. As the intensity of the induction electric field increases, the more horizontal sections of "----" displays on the LCD, and the higher the sound frequency of the buzzer.


Note: When the tested electric field voltage is $\geq AC 100V$, pay attention to whether the conductor of the measured electric field is insulated to avoid electric shock.

10. 6. Automatic shutdown function (APO)

In order to save power consumption, the meter will turn on the APO automatic shutdown function by default after it is turned on and Bluetooth is not open. If the user does not operate the meter within 15 minutes, the meter will automatically turn off the power. How to cancel the APO function, please reference Section 8 (Key Function, Item 3) about instructions of how to cancel the automatic shutdown function.

10. 7. Bluetooth instruction

Short press the Bluetooth key to open/close the Bluetooth function. After open the Bluetooth, if it is not connected with the mobile APP, the Bluetooth symbol will flash on the display screen. First, open the AILink APP on the mobile terminal, search for the smart clamp meter to establish the connection, then data communication and mobile APP key control operation can be carried out. After the Bluetooth is connected successfully, the Bluetooth symbol on the display screen is fixed and does not flash.

( Note: Once connected, the meter will close automatically APO automatic shutdown function, the meter will not automatically shut down, in order to save power, please turn off manually Bluetooth or meter without use)

10.8. Bluetooth download

Please scan the QR code below to download, or search for "AILink" in App Market/App Store (iPhone device) to download and install the "AILink APP".



11. Technical index

Accuracy : \pm (% reading + word number), calibration period one year

Ambient temperature: $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, humidity less than 75%RH

Temperature coefficient: Temperature condition Accuracy is 18°C to 28°C , Ambient temperature fluctuation range is within $\pm 1^{\circ}\text{C}$ steadily. When the temperature is $<18^{\circ}\text{C}$ or $\geq 28^{\circ}\text{C}$, Accessory temperature coefficient error is $0.1 \times$ (specified accuracy) / $^{\circ}\text{C}$

Performance (Note "▲" indicates that the meter has this range)

function	▲
AC voltage ACV	▲
DC voltage DCV	▲
AC voltage low pass filter VFC	▲
AC current ACA	▲
Ac current low pass filter VFC	▲
surge current INR	▲
AC voltage PEAK capture PEAK	▲
AC current PEAK capture PEAK	▲
resistance Ω	▲
Diode	▲
Continuity	▲
Capacitance	▲
NCV	▲
Bluetooth APP	▲

11.1. AC current

11.1.1. ACA

Range	Accuracy	Resolution	Overload protection
100A	$\pm(2.5\%+30)$	0.01A	1000Arms
1000A	$\pm(4.0\%+10)$	0.1A	

11.1.2. ACA-VFC

Range	Accuracy	Resolution	Overload protection
1000A	$\pm(5.0\%+10)$	1A	1000Arms

11.1.3. ACA-INR

Range	Accuracy	Resolution	Overload protection
1000A	$\pm(10\%+20)$	0.1A	1000Arms

▲ Frequency response: 50Hz~60Hz;

Display: the current True RMS; Suitable for 10%- 100% of the range

Open circuit of the current range allows ≤ 10 words of remaining readings;

When the measured current is higher than 500A, the continuous test time cannot exceed 60 seconds.

Max. display value:999.9A

Accuracy is 10% to 100% of the range.

11.2. AC voltage (V~)

Range	Accuracy	Resolution	Overload protection
10V	$\pm (0.8\%+5)$	0.001V	600VDC/ACrms
100V		0.01V	
600V	$\pm (1.2\%+10)$	0.1V	

▲ Input impedance: $\geq 10\text{M}\Omega$;

Min. Identification voltage:0.6V

Frequency response:40Hz~400Hz; Display: True RMS

Accurate value is 5% to 100% of the range.

V.F.C low-pass filter measurement mode only in the 600v range, no decimal places.

V.F.C low-pass filter measurement accuracy needs to add 5%;

11.3. DC voltage (V⁻⁻⁻)

Range	Accuracy	Resolution	Overload protection
10V	$\pm (0.5\%+5)$	0.001V	600VDC/ACrms
100V		0.01V	
600V	$\pm (1.0\%+10)$	0.1V	

▲ Input impedance: $\geq 300\text{k}\Omega$;

Min. Identification voltage:0.6V

11. 4. Resistance

Range	Accuracy	Resolution	Overload protection
100Ω	± (1.3%+10)	0.1Ω	250V DC/ACrms
1000Ω	± (1.3%+5)	0.1Ω	
10kΩ	± (0.8%+3)	0.001kΩ	
100kΩ		0.01kΩ	
1MΩ	± (1.5%+5)	0.1kΩ	
10MΩ		0.001MΩ	

Open circuit voltage: about 1V.Max. display value:9.999MΩ

The accurate value is 5% to 100% of the range.

11. 5. Continuity test

Range	Accuracy	Resolution	Open circuit V	Overload protection
600Ω	>50Ω, Consecutive beeps	0.1Ω	about 1V	250V AC/DC

11. 6. Diode test

Range	Accuracy	Resolution	Overload protection
3V	Max. Measurement 3V, open circuit voltage is about 3V, Open circuit $\leq 2\text{mF}$	0.001V	250V AC/DC

11. 7. Capacitance

Range	Accuracy	Resolution	Overload protection
100nF	± (5.0%+50)	0. 01nF	250V AC/DC
1000nF	± (4.0%+50)	0. 1nF	
10μF	± (3.5%+20)	0.001μF	
100μF		0.01μF	
1000μF		0. 1μF	
10mF		0.0 01mF	
100mF	± (10%+20)	0.01mF	

200mF	Unspecified	0.1mF	
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⚠ Measured value = measured display value-test lead open circuit value.

The accurate value is 5% to 100% of the range.

Large capacitance response time: $\geq 1\text{mF}$ about 8s; measurement error does not include lead distributed capacitance.

12. INSTRUMENT MAINTENANCE

1. The power supply of this product is 2 pieces AAA batteries, if the meter meets following conditions, please replace the batteries.

- (1) When LCD displays low battery "☹" symbol.
- (2) When the brightness of the LCD back light decreases.
- (3) When the buzzer sound of the meter becomes smaller.

⚠ Note: Please turn off the power or take out the battery if you do not operate for a long time.

2. General maintenance

- (1) The maintenance and service of this instrument must be completed by professional maintenance personnel or designated maintenance service department.
- (2) Please take out the battery when it is not used for a long time to avoid corrosion of the instrument caused by battery leakage.
- (3) Pay attention to waterproof, dustproof and anti-fall.

- The present operation instruction is subject to change without notice.
- The content of the operation instruction is regarded as correct. Whenever any user finds its mistakes, omission, etc., he or she is requested to contact the manufacturer.
- The present manufacturer is not liable for any accident and hazard arising from the customer misuse or inadvertent operation.
- The functions described in this operation instruction should not be used as grounds to apply this product to a particular purpose.