DIGITAL MULTIMETER
OPERATOR'S MANUAL

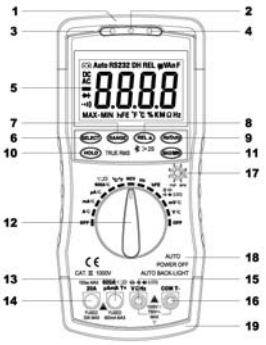
1. Overview

The multimeter is characterized at slim size, portable, stable performance and anti-dropping capacity. Using 6000 counts digit LCD monitor with character 22mm high, they offer clear readings. With overall circuitry design centering on large-scale IC A/D converters in conjunction and over-load protection circuit, the meters give excellent performance and exquisite making as a handy utility instrument.

The meter can be used to measure DC & AC voltage, DC & AC current (600A range with AC/DC current clamp adapter), resistance, capacitor, frequency, duty cycle, temperature, transistor hFE, Non Contact AC Voltage (NCV) detection, positive diode voltage fall and audible continuity.

The meter can be connected with mobile phone by wireless transmission, and display on phone by APP, you can remote monitoring the measurement condition, the distance control is 10～15m.

2. Panel Layout



① NCV detection area: Non Contact AC Voltage (NCV) detection area.

② **CDS** sensor: The CDS sensor can reaction to the ambient brightness range, then automatically control the LCD backlight to lighten or go out.

③ NCV red light: Non Contact AC Voltage (NCV) detection red light.

④ NCV green light: Non Contact AC Voltage (NCV) detection green light.

⑤ LCD display: 6000 counts digit, full function symbol display.

⑥ **SELECT** key: This key work on the "Ω ⊣▶ •))) ⊣⊢" range, press the key to choose resistance、diode、continuity or capacitance test, on the voltage or current range, change to DC or AC, on the **°C/°F** range, change to ℃ or ℉ test; If press and hold SELECT key to power on, "Auto Power Off " function will be disabled.

⑦ **RANGE** Key: Press the "**RANGE**" key, the meter enters manual range mode, press it more than 2 seconds again, return to auto mode.

⑧ **REL▲** Key: Press the "**REL▲**" key, the meter enters relative measuring mode, "**REL**" is displayed on the LCD and the present reading becomes the reference value and displayed on the display. Relative measurement R*EL△=measurement value-Reference value*. Press it again to exit. Press it over 2 seconds to enter RS232 data transmission mode, the meter can be connected with mobile phone by APP, press it over 2 seconds again to exit.

⑨ **Hz/Duty** Key: On "ACV/ACA" or "Hz" range, press the "**Hz/Duty**" key, you can choose the **Frequency** or **Duty Cycle** measurement.

⑩ **HOLD** key: Press the "**HOLD**" key to lock display value, and the "**DH**" sign will appear on the display, press it again to exit.

⑪ **MAX/MIN** key: Press the "**MAX/MIN**" key to lock **MAX**, **MIN** or **MAX-MIN** value, and the "**MAX**", "**MIN**" or "**MAX-MIN**" sign will appear on the display, press it over 2 seconds to exit.

⑫ Rotary Switch: Use this switch to select functions and ranges.

⑬ **μAmA600AT+:** μAmA, 600A current clamp adapter and Temperature "+" Input Jack

⑭ **20A:** 20A Input Jack

⑮ **VΩHz⊣▶ •))) ⊣⊢ :** V/Hz/ Ω ⊣▶ •))) ⊣⊢ Input Jack

⑯ **COMT-:** COM and Temperature "-" Input Jack

⑰ Transistor hFE test Input Jack

⑱ Crust of meter

⑲ Protective casing

3. Safety Information

3-1 The meter is designed according to IEC-1010 concerning electronic measuring instruments with an over-voltage category 1000V (CAT Ⅲ) and pollution 2.

3-2 Follow all safety and operating instructions to ensure that the meter is used safely and is kept in good operating condition.

3-3 safety symbols:

⚠ Important safety information, refer to the operating manual.

⚠ Dangerous voltage may be presence.

⧈ Double insulation (protection Class II)

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 avid risk of electric shock, do not use the meters before the cover is in place.

4-3 The range switch should be right position for the testing.

4-4 To avoid electric shock and damaging the instruments, the input signals are forbidden to exceed the specified limits.

4-5 When measuring TV set or switched power, attention should be paid to the possible pulses that 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 of measuring voltage higher than DC 60V & AC 30V.

4-8 Protection fuse should be replaced only with same type and same specification.

4-9 After operation is finished, set function switch at OFF to save battery power.

4-10 If the meter is without usage for long time, take out battery to avoid damage by battery leakage.

5. GENERAL SPECIFICATIONS

5-1 Max Voltage between input terminal and Earth Ground: CAT Ⅲ 1000V

5-2 Over-range Indication: display "OL" for the significant digit.

5-3 Automatic display of negative polarity "-" .

5-4 Low Battery Indication: "▭" displayed.

5-5 Max LCD display: 6000 counts digit.

5-6 Auto range & Manual range control

5-7 Auto Power Off: When measurement exceeds 15 minutes without switching mode and pressing key, the meter will switch to standby mode. Press any key to exit standby mode. When restart the system, press and hold **SELECT** key to disable auto power off. It can not auto power off in the RS232 mode.

5-8 Auto LCD backlight

5-9 Fuse protection: 800mA/250V Fast Fuse, 20A/250V Fast Fuse

5-10 Power supply: 1.5V×2 "AA" R6P battery

5-11 Operating Temp.: 0℃ to 40℃ (relative humidity <85%)

5-12 Storage Temp.: -10℃ to 50℃ (relative humidity <85%)

5-13 Guaranteed precision Temp.: 23±5℃ (relative humidity <70%)

5-14 Dimension: 195x88x40mm

5-15 Weight: approx. 350g (including battery)

6. Testing Specifications

Accuracy is specified for a period of year after calibration and at 18℃ to 28℃ (64℉ to 82℉) with relative humidity to 70%.

6-1 DC Voltage

Range	Resolution	Accuracy
60mV	0.01mV	±(0.8% of rdg + 2 digits)
600mV	0.1mV	±(0.5% of rdg + 2 digits)
6V	1mV	
60V	10mV	
600V	100mV	
1000V	1V	±(0.8% of rdg + 2 digits)

-- Impedance: 10MΩ, More than 100MΩ on 60mV/600mV range

-- Overload protection: 1000V DC or 750V AC rms

6-2 AC Voltage (True RMS)

Range	Resolution	Accuracy
60mV	0.01mV	±(1.5% of rdg + 3 digits)
600mV	0.1mV	±(1.0% of rdg + 3 digits)
6V	1mV	
60V	10mV	
600V	100mV	
750V	1V	±(1.5% of rdg + 3 digits)

-- Impedance: 10MΩ, More than 100MΩ on 60mV/600mV range

-- Overload protection: 1000V DC or 750V AC rms

-- Frequency Range: 40 to 400Hz

6-3 DC Current

Range	Resolution	Accuracy
600μA	0.1μA	±(1.2% of rdg + 2 digits)
6000μA	1μA	
60mA	10μA	
600mA	100μA	
6A	1mA	±(2.0% of rdg + 3 digits)
20A	10mA	
600A	100mA	±(2.5% of rdg + 5 digits)

-- 600A range with AC/DC Current Clamp Adapter

-- Overload protection: 800mA/250V Fast Fuse, 20A/250V Fast Fuse, 20A up to 10 seconds

6-4 AC Current (True RMS)

Range	Resolution	Accuracy
600μA	0.1μA	±(1.5% of rdg + 3 digits)
6000μA	1μA	
60mA	10μA	
600mA	100μA	
6A	1mA	±(2.5% of rdg + 5 digits)
20A	10mA	
600A	100mA	±(3.0% of rdg + 5 digits)

-- 600A range with AC/DC Current Clamp Adapter

-- Overload protection: 800mA/250V Fast Fuse, 20A/250V Fast Fuse, 20A up to 10 seconds

-- Frequency Range: 40 to 400Hz

6-5 Resistance

Range	Resolution	Accuracy
600Ω	0.1Ω	±(1.0% of rdg + 3 digits)
6kΩ	1Ω	±(1.0% of rdg + 2 digits)
60kΩ	10Ω	
600kΩ	100Ω	
6MΩ	1kΩ	
60MΩ	10kΩ	±(1.5% of rdg + 3 digits)

-- Overload protection: 500V DC or AC rms

6-6 Capacitance

Range	Accuracy	Resolution
6nF	±(5.0% of rdg + 10 digits)	1pF
60nF	±(3.0% of rdg + 10 digits)	10pF
600nF		100pF
6μF		1nF
60μF	±(5.0% of rdg + 10 digits)	10nF
600μF	±(10.0% of rdg + 20 digits)	100nF
6mF		1μF
60mF		10μF

-- Overload protection: 500V DC or AC rms

6-7 Frequency

Range	Accuracy	Resolution
9.999Hz	± (0.1% of rdg + 5 digits)	0.001Hz
99.99Hz		0.01Hz
999.9Hz		0.1Hz
9.999kHz		1Hz
99.99kHz		10Hz
999.9kHz		100Hz
9.999MHz		1kHz

-- Sensitivity: sine wave 0.6V rms (9.999MHz: 1.5V rms)

-- Overload protection: 500V DC or AC rms

6-8 Duty cycle

0.1%～99.9%: ± (2.0% of rdg + 2 digits), Frequency lower than 10kHz

-- Sensitivity: sine wave 0.6V rms

-- Overload protection: 500V DC or AC rms

6-9 Temperature

Range	Accuracy		Resolution
℃	-20~150℃	± (3℃+ 1digit)	1℃
	150~1000℃	± (3% of rdg + 2digits)	
℉	-4~302℉	± (5℉+ 2digits)	1℉
	302~1832℉	± (3% of rdg + 3digits)	

-- NiCr-NiSi K-type sensor

-- Overload protection: 800mA/250V Fast Fuse

6-10 Diode and Audible continuity test

Range	Description	Test Condition
⊣▶⊢	Display read approximately forward voltage of diode	Forward DC current approx. 1.5mA Reversed DC voltage approx. 4V
•)))	Built-in buzzer sounds if resistance is less than 50Ω	Open circuit voltage approx. 2V

Overload protection: 500V DC or AC rms

6-11 Transistor hFE test

Test range: 0-1000

Ib=10μA, Vce=1.8V Approx.

6-12 Non Contact AC Voltage (NCV) detection

Test voltage range: 90V～1000V AC rms

The NCV red light and green light will light up alternately together with sound.

7. OPERATING INSTRUCTIONS

7-1 Attention before operation

7-1-1 Check battery. When the battery voltage drop below proper operation range, the "▭" symbol will appear on the LCD display and the battery need to changed.

7-1-2 Pay attention to the "⚠" besides the input jack which shows that the input voltage or current should be within the specified value.

7-1-3 The range switch should be positioned to desired range for measurement before operation.

7-2 Measuring DC & AC Voltage

7-2-1 Set the rotary switch at the desired "**mV⎓**" or "**V⎓**" range position, it shows symbol for testing DC voltage, if you want to test AC voltage, push "**SELECT**" button switch.

7-2-2 Connect the black test lead to **COMT-** jack and the red to **VΩHz** jack.

7-2-3 Connect test leads across the source or load under measurement.

7-2-4 You can get reading from LCD. The polarity of the red lead connection will be indicated along with the DC voltage value.

NOTE:

1."⚠" means you can't input the voltage more than 1000V DC or 750V AC, it's possible to show higher voltage, but it may destroy the inner circuit or pose a shock.

2. Be cautious against shock when measuring high Voltage.

7-3 Measuring DC & AC Current

7-3-1 Set the rotary switch at the desired "**uA⎓**" & "**mA⎓**" & "**A⎓**" range position, it shows symbol for testing DC current, if you want to test AC current, push "**SELECT**" button switch.

7-3-2 Connect the black test lead to **COMT-** jack and the red to the **μAmAT+** jack for a maximum 600mA current , for a maximum 6A or 20A current, move the red lead to the **20A** jack.

7-3-3 Connect test leads in series with the load under measurement.

7-3-4 You can get reading from LCD. The polarity of the red lead connection will be indicated along with the DC current value.

NOTE:

1. When the value scale to be measured is unknown beforehand, set the range selector at the highest position.

2. When only "OL" is displayed, it indicates over-range situation and the higher range has to be selected.

3. "⚠" means the socket mA's maximum current is 800mA and 20A's maximum current is 20A, over 800mA or 20A current can be protected by the fast fuse.

4. On the 20A range, the measuring time should be less than 10 seconds to prevent precision from affecting by circuit heating.

7-4 Measuring DC & AC 600A Current

7-4-1 Set the rotary switch at the desired "**600A⎓**" range position, it shows symbol for testing DC current, if you want to test AC current, push "**SELECT**" button switch.

7-4-2 Connect the black banana plug of the AC/DC Current Clamp Adapter(Optional accessories) to **COMT-** jack and the red banana plug to the **μAmAT+** jack.

7-4-3 Set the AC/DC Current Clamp Adapter(Optional accessories) to "**1mV/A**" range.

7-4-4 When perform DC current measurement, always rotate or push the DCA zero adjuster on the Clamp Adapter(Optional accessories) until the multimeter reads zero.

7-4-5 Clamp the Jaws around the **one** conductor to be measured. Center the conductor within the Jaw using the Centering Marks as guides.

7-4-6 Read the result from the LCD panel. The arrow in the Jaw indicates the DC current direction of positive current flow (positive to negative).

7-5 Measuring Resistance

7-5-1 Set the rotary switch at the desired "Ω ⊣▶ •))) ⊣⊢" range position.

7-5-2 Connect the black test lead to **COMT-** jack and the red to **VΩHz** jack.

7-5-3 Connect test leads across the resistance under measurement.

7-5-4 You can get reading from LCD.

NOTE: Max. input overload: 500V rms＜10sec

1. For measuring resistance above 1MΩ, the mete may take a few seconds to get stable reading.

2. When the input is not connected, i.e. at open circuit, the figure 'OL' will be displayed for the over-range condition.

3. When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.

7-6 Measuring Capacitance

7-6-1 Set the rotary switch at the desired "Ω ⊣▶ •))) ⊣⊢" range position, push "**SELECT**" to choose capacitance measurement.

7-6-2 Connect the black test lead to **COMT-** jack and the red to **VΩHz** jack.

7-6-3 Connect test leads across the capacitance under measurement.

7-6-4 You can get reading from LCD.

NOTE: Max. input overload: 500V rms＜10sec

1. Capacitors should be discharged before being tested.

2. When testing large capacitance, it will take longer time before the final indication (For 100uF~60mF range, it will take about 10 seconds).

3. When testing small capacitance (≤1uF), to assure the measurement accuracy, first press "REL▲", then go on measuring.

7-7 Measuring Frequency & Duty cycle

7-7-1 Set the rotary switch at the desired "**Hz**" range position.

7-7-2 Connect the black test lead to **COMT-** jack and the red to **VΩHz** jack.

7-7-3 Push "**Hz/Duty**" key to choose **Frequency** or **Duty cycle** test.

7-7-4 Connect the probe across the source or load under measurement.

7-7-5 You can get reading from LCD.

7-8 Measuring Temperature

7-8-1 Set the rotary switch at the desired "**℃/℉**" range position, push "**SELECT**" to choose ℃ or ℉ measurement.

7-8-2 Connect the black banana plug of the sensor to **COMT-** jack and the red banana plug to the **μAmAT+** jack.

7-8-3 Put the sensor probe into the temperature field under measurement.

7-8-4 You can get reading from LCD.

NOTE:

1. Please don't change the thermocouple at will, otherwise we can't guarantee to measure accuracy.

2. Please don't importing the voltage in the temperature function.

7-9 Diode & Audible continuity Testing

7-9-1 Set the rotary switch at the "Ω ⊣▶ •))) ⊣⊢" range position, push "**SELECT**" to choose **Diode** or **Audible continuity** measurement.

7-9-2 Connect the black test lead to **COMT-** jack and the red to **VΩHz** jack.

7-9-3 On **diode** range, connect the test leads across the diode under measurement, display shows the approx. forward voltage of this diode.

7-9-4 On **Audible continuity** range, connect the test leads to two point of circuit, if the resistance is lower than approx. 50Ω, the buzzer sounds.

NOTE: Make sure the power is cut off and all capacitors need to be discharged under this measurement.

7-10 Transistor hFE Test

7-10-1 Set the rotary switch at the desired "**hFE**" range position.

7-10-2 Determine whether the transistor is NPN or PNP and locate the Emitter, Base and Collector leads. Insert the leads into the proper holes in the socket on the front panel.

7-10-3 You can get reading of the approximate hFE value from LCD.

NOTE: Don't connect an external voltage to measuring terminals.

7-11 Non Contact AC Voltage detection

7-11-1 Set the rotary switch at the desired "**NCV**" range position, the NCV green LED light will light up.

7-11-2 Hold the Meter so that the mater's top is vertically and horizontally centered and contacting the conductor, when the live voltage ≥ 90V AC rms, the NCV red LED light and green LED light will light up alternately together with sound.

NOTE:

1. Even without LED indication, the voltage may still exist. Do not rely on non-contact voltage detector to determine the presence of voltage wire. Detection operation may be subject to socket design, insulation thickness and different type and other factors.

2. When the meter input terminals presence voltage, due to the influence of presence voltage, voltage sensing indicator may also be bright.

3. Keep the meter away from electrical noise sources during the tests, i.e., florescent lights, dimmable lights, motors, etc.. These sources can trigger Non-Contact AC Voltage detection function and invalidate the test.

7-12 Connect to mobile phone APP

On any range, press the "**REL▲**" key over 2 seconds, the "**RS232**" sign will appear on the display, the meter will has serial data output function. It can be connected with mobile phone by Bluetooth, so the measured data can be recorded, analyzed, and processed by mobile phone APP. Before use this function, you need install the mobile phone APP "Intelligent Meter" by scan the QR code.

It includes the "Intelligent Meter" APP packages for download and detailed installation and usage instructions.

⚠NOTE: The mobile phone APP can be installed in iphone 4S iOS 7.0 or android 4.30 system and up.

8. Battery replacement

8-1 When the battery voltage drop below proper operation range the "▭" symbol will appear on the LCD display and the battery need to changed.

8-2 Before changing the battery, set the selector switch to "**OFF**" position and remove the test leads from the terminals. Open the cover of the battery cabinet by a screwdriver.

8-3 Replace the old battery with the same type battery (AA R6P 1.5V×2).

8-4 Close the cover of the battery cabinet and fasten the screw.

9. Fuse replacement

9-1 This meter is provided with a 800mA/250V fast fuse to protect the temperature test and the current measuring circuits which measure up to 600mA, with a 20A/250V fuse to protect the 20A range.

9-2 Ensure the meter is not connected to any external circuit, set the selector switch to "**OFF**" position and remove the test leads from the terminals. Open the cover of the battery cabinet by a screwdriver.

9-3 Replace the old fuse with the same type and rating: 5×20mm 800mA/250V fast fuse or 5×20mm 20A/250V fast fuse.

9-4 Close the cover of the battery cabinet and fasten the screw.

10. Maintenance

10-1 You must replace the test leads if the lead is exposed, and should adopt the leads with the same specifications as origin.

10-2 Use only moist fabric or small amount of detergent but not chemical solution for cleaning.

10-3 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.

10-4 Please take out the battery when not using for a long time.

11. Accessories

[1] Test Leads: electric rating 1000V 20A

[2] "K" type thermocouple sensor probe

[3] Operator's Manual

[4] Clamp Adapter(Optional accessories)

Above picture and content just for your reference. Please be subject to the actual products if anything different or updated. Please pardon for not informing in advance.

Intelligent Meter
Operation manual

Summary

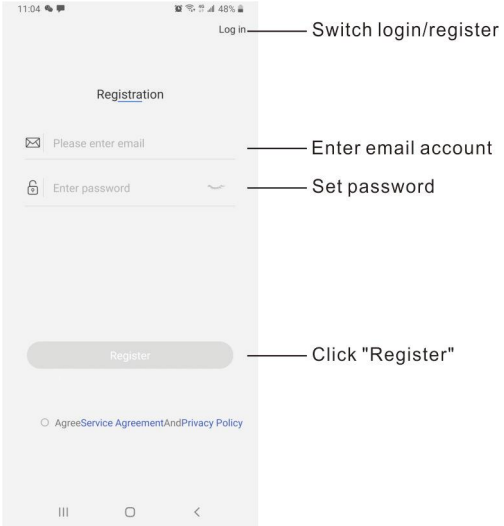
Intelligent Meter is a comprehensive intelligent hardware management platform. Through Intelligent Meter App, you can complete the convenient between mobile phones and intelligent hardware,achieve the interconnection and intercommunication between devices and users. Intelligent Meter supports multiple types of devices, Such as intelligent instrument, electrical instrument, anemometer and infrared thermometer.

APP download and installation

Scan the below QR code to download directly, or search for "Intelligent Meter" in the APP Store, Google Play download and install the "Intelligent Meter".

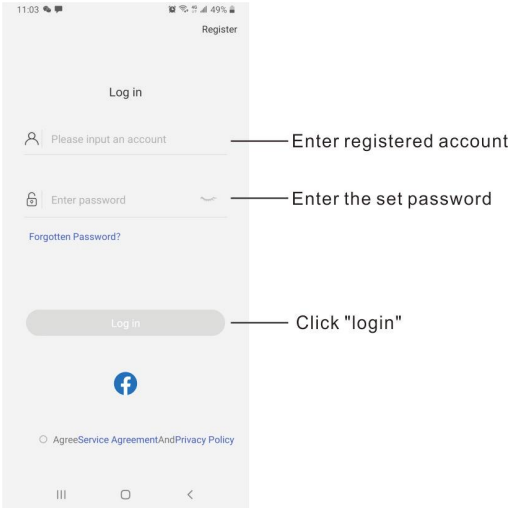
Account registration

To register an email account, enter the email number and password, and click Register. This account is used for future login;



Account login

Enter the account and password and click login



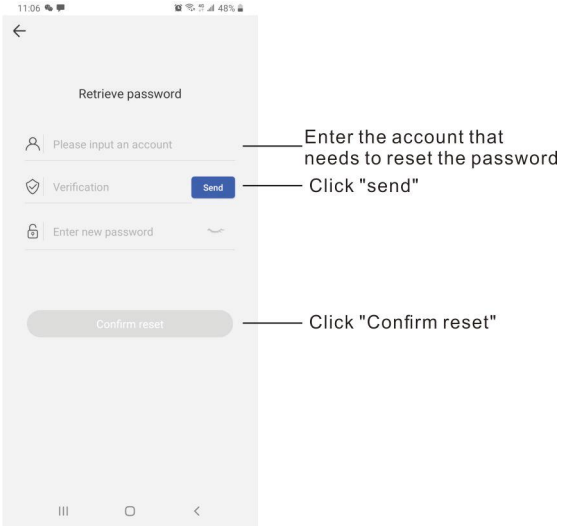
Retrieve password

When the user forgets the login password, the login password can be reset through this function .

1) Enter the account number to retrieve the password;

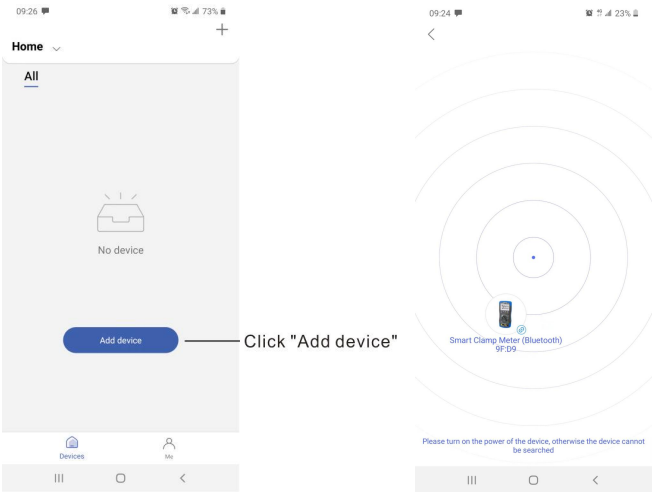
2) Click the "send" button to send the verification code to the email;

3) Enter the verification code, reset the new password, click "submit reset", and then you can log in to the app with the new password .

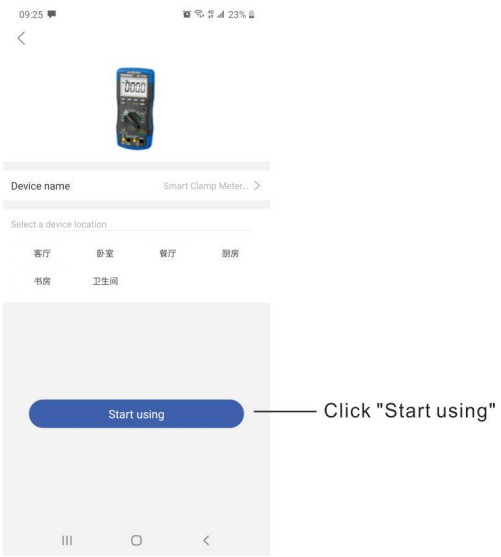


Add device

1) Click add equipment, select the equipment to be added, and operate according to the operation instructions to add;



2) Click "start using" to enter the function page.

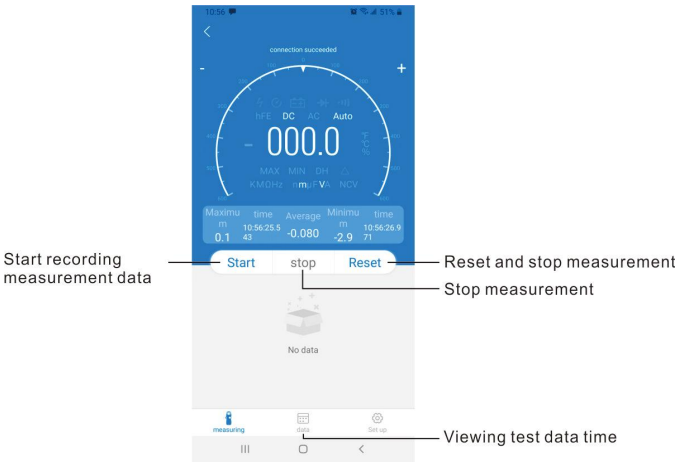


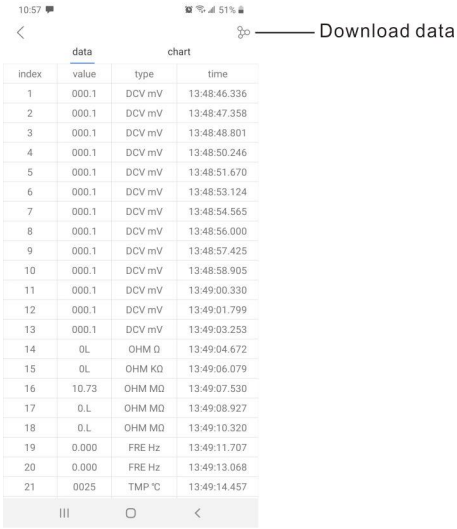
Function

1) The maximum or minimum value and the corresponding time will be displayed on the mobile phone application, and the average value over a period of time from the start of measurement will also be displayed.

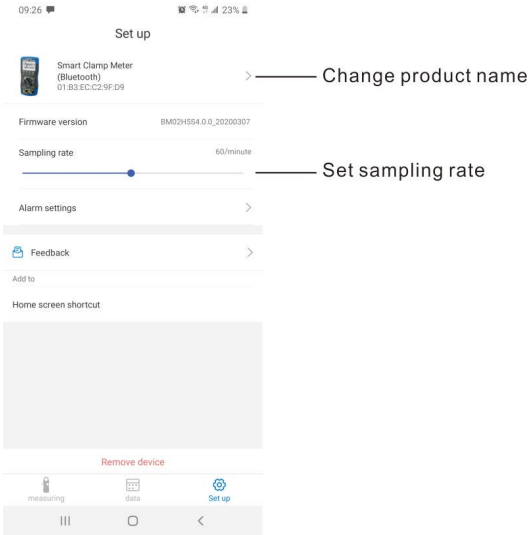
2) Press the "start" key to start recording measurement data, and press the "stop" key to stop recording. Press the "reset" key to reset and stop the measurement, clear the old data and restart the recording.。

3) Click the "data" button to view the historical record time and historical record data, and press the button at the upper right corner to share or download data.





4) Click "setting" to enter the setting interface, click the device image to change the product name, view the firmware version and set the sampling rate.



※ After using this product, if it is not used for a long time, it is recommended to take out the battery, otherwise the battery will be consumed all the time.

CONTACT US

For any problem or concern, welcome to email us for prompt response.

AFTERSALES1010@HOTMAIL.COM

P.S.

To make sure you can receive immediate solution and your requests processed quickly, please email us with these information:

1. **Order Number**
2. **Platform of Your Purchase**
3. **Full Model Number**
4. **Description of the Problem(Attaching videos or photos can help us troubleshoot the problems even faster)**

FCC Caution:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception,
which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different
from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.