

# multicomp<sup>PRO</sup>



## Oscilloscope Meter User Manual

**MP120**

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# 1.Safety Information

(Be sure to read the safety information before using this product.)

## General Safety Requirements

- **Before first use**, please read the following safety precautions to avoid any possible personal injury and prevent this product or any other products connected to it from damage.
- **Limit operation to the specified measurement category, voltage, or amperage ratings.**
- **Do not use the oscilloscope meter if it is damaged.** Before you use the oscilloscope meter, inspect the case. Look for cracks or missing plastic. Pay particular attention to the insulation surrounding the connectors.
- **Do not use the test leads provided for other products.** Use only the certified test leads specified for this product.
- Inspect the test leads for damaged insulation or exposed metal.
- Before use, verify the oscilloscope meter's operation by measuring a known voltage.
- **No user serviceable parts inside.** Do not disassemble, all servicing must be done by an approved technician.
- **Always use the specified battery type.** The power for the oscilloscope meter is supplied with a battery. Observe the correct polarity markings before you insert the batteries to ensure proper insertion of the batteries in the oscilloscope meter.
- **Check all Terminal Ratings.** To avoid fire or shock hazard, check all ratings and markers of this product. Refer to the user's manual for more information about ratings before connecting to the oscilloscope meter.
- Do not operate the oscilloscope meter with the cover or portions of the cover removed or loosened.
- **Use Proper Fuse.** Use only the specified type and rating fuse for the oscilloscope meter.

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- **Do not operate if in any doubt.** If you suspect damage has occurred to the oscilloscope meter, have it inspected by qualified service personnel before further use.
  - **Do not operate this product in wet or damp conditions.**
  - **Do not operate in an explosive atmosphere.**
  - **Keep product surfaces clean and dry.**
  - Do not apply more than the rated voltage (as marked on the oscilloscope meter) between terminals, or between terminal and earth ground.
  - When measuring current, turn off the circuit power before connecting the oscilloscope meter in the circuit. Remember to place the oscilloscope meter in series with the circuit.
  - Use caution when working above 60 V DC, 30 V AC RMS, or 42.4 V peak. Such voltages pose a shock hazard.
  - When using the test leads, keep your fingers behind the finger guards on the test leads.
  - Remove the test leads from the oscilloscope meter before you open the battery cover.
  - To avoid false readings, which may lead to possible electric shock or personal injury, recharge the battery as soon as the low battery indicator appears and flashes.
  - Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.
  - **Use the proper terminals, function, and range for your measurements.** When the range of the value to be measured is unknown, set the rotary switch position as the highest range, or choose the auto ranging mode. To avoid damages to the oscilloscope meter, do not exceed the maximum limits of the input values shown in the technical specification tables.
  - Connect the common test lead before you connect the live test lead. When you disconnect the leads, disconnect the live test lead first.
  - Before changing functions, disconnect the test leads from the circuit under test.

---

## Measurement Category

The oscilloscope meter has a safety rating of 1000 V,CAT III.

### Measurement category definition

**Measurement CAT I** applies to measurements performed on circuits not directly connected to the AC mains. Examples are measurements on circuits not derived from the AC mains and specially protected (internal) mains-derived circuits.

**Measurement CAT II** applies to protect against transients from energy-consuming equipment supplied from the fixed installation, such as TVs, PCs, portable tools, and other household circuits.

**Measurement CAT III** applies to protect against transients in equipment in fixed equipment installations, such as distribution panels, feeders and short branch circuits, and lighting systems in large buildings.

**Measurement CAT IV** applies to measurements performed at the source of the low-voltage installation. Examples are electricity meters and measurements on primary over current protection devices and ripple control units.

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## Safety Terms and Symbols

### Safety Terms

**Terms in this Manual.** The following terms may appear in this manual:



**Warning:** Warning indicates the conditions or practices that could result in personal injury or death.



**Caution:** Caution indicates the conditions or practices that could result in damage to this product or other property.

**Terms on the Product.** The following terms may appear on this product:

**Danger:** It indicates an injury or hazard may immediately happen.

**Warning:** It indicates an injury or hazard may be accessible potentially.

**Caution:** It indicates a potential damage to the instrument or other property might occur.

### Safety Symbols

**Symbols on the Product.** The following symbol may appear on the product:

	Direct current (DC)		Fuse
	Alternating current (AC)		Caution, risk of danger (refer to this manual for specific Warning or Caution information)
	Both direct and alternating current	<b>CAT I</b>	Category I overvoltage protection
	Ground terminal	<b>CAT II</b>	Category II overvoltage protection
	Conforms to European Union directives	<b>CAT III</b>	Category III overvoltage protection
	Equipment protected throughout by double insulation or reinforced insulation	<b>CAT IV</b>	Category IV overvoltage protection

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## 2.Quick Start

### General Inspection

After you get a new oscilloscope meter, make a check on the instrument according to the following steps:

1. Check whether there is any damage caused by transportation.  
If it is found that the outer carton or internal packaging has suffered serious damage, do not dispose of it until the complete device and its accessories have been thoroughly tested.
2. Check the Accessories  
Check that all the accessories are intact. If there is any accessory missing or damaged, please get in touch with the Multicomp-pro distributor.
3. Check the Complete Instrument  
If it is found that there is damage to the appearance of the instrument, or the instrument does not work normally, or fails in the performance test, please get in touch with the Multicomp-pro distributor.  
If there is damage to the instrument caused by the transportation, please keep all the packaging. Please get in touch with the Multicomp-pro distributor to arrange repair or replacement as required.

### Battery Replacement

The oscilloscope meter is powered by a pre-fitted 3.7V 2600mA (18650) type lithium battery.



**Warning:** To avoid false readings, which could lead to possible electric shock or personal injury, recharge the battery as soon as the low battery indicator appears using the supplied USB C cable.

If the battery is to be replaced, turn off the meter, disconnect test leads and any connectors from any circuit under test, remove test leads from the input terminals. Use only the specified battery type.

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Use the following procedure to replace the battery:

- (1) Power off, remove test leads and any connectors from the input terminals.
- (2) Lift the tilt stand and loosen the screw with a suitable Phillips screwdriver and remove the battery cover.
- (3) Observe the battery polarity indicated inside the battery compartment, Insert the battery.
- (4) Place the battery cover back in its original position and tighten the screw.



**Caution:** To avoid instruments being damage from battery leakage, remove the batteries and store them separately if the oscilloscope meter is not going to be used for a long period.


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## Adjusting the Tilt Stand

Pull the tilt stand outward to its maximum reach (about 85° to the meter body).

## Power on/off


It can be turned on in the following ways:

- Press the  button at the bottom left of the host;
- Power on automatically after battery installation.

### **Note:**






After the first boot, Reset, or battery removal, you will need to configure the date and time manually. Please refer to page **29** for detailed instructions on “**System Settings**”, specifically under the **Date | Time** section.

It can be turned off in the following ways:

- Manual shutdown, tap and hold  button (when the power is connected, the shutdown will enter the standby mode);
- Automatic shutdown, emit a short beep one minute before shutdown, emit a long beep during shutdown;
- Low power automatic shutdown.

---

## Selecting the Range

- Auto ranging is set as default when the meter is powered on, **Auto** is displayed.
- Under automatic range, press  or  to enter the manual range mode.
- Under manual range, each additional press of  sets the oscilloscope meter to the next higher range; each additional press of  sets the oscilloscope meter to the next lower range.
- Under manual range, press  to enter the auto range mode.

**Note:** Manual range is not available when measuring capacitance.

## Measurement Connections

After selecting the desired measurement function, to avoid instrument damage, do not discretionarily switch the measurement function when measuring.

# 3.Instrument Panel



## Front Panel and Keys




The front panel and keys of the oscilloscope meter are shown in Figure 3-1:



Figure 3-1: Front panel

Description:

Num	Illustration in multimeter mode	Illustration in oscilloscope mode
1	Display area.	
2	The <b>F1 - F4</b> keys are multi-function keys. In each menu mode, press the corresponding key to select the corresponding menu item.	
3	Function key, press to select the corresponding function.	Only  and  function.

4	Comparative value key.	Trigger menu key.
5	<p>Function of direction keys ▲ ▼ : used for changing range.</p> <p>Function of  key: Restore auto gear.</p>	<p>Function of direction keys ▲ ▼ : used for the amplitude scales.</p> <p>Function of direction keys ◀ ▶ : used for zooming waveforms and the time base changing.</p> <p>Function of  key: Perform automatic setup.</p>
6	Relative value key.	Trigger value key, press it will automatically setting the trigger level to half of the current signal's Vpp.
7	Enter the system settings key.	
8	Image save key.	
9	Measurement input port.	
10	Value hold key.	Stop/Run key.
11	 : Long press to turn off, short press to turn on or display the status bar.	
12	Switch key for working state of oscilloscope and multimeter.	
13	Maximum and minimum value measurement button.	Measurement value display button.

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## Side Panel



Figure 3-2: Side panel

Description:

1. Charging or USB communication interface  
(Note: The measurement input port is not available when the interface is charging or communicating).
2. Bracket.

# 4.How to Use the Multimeter

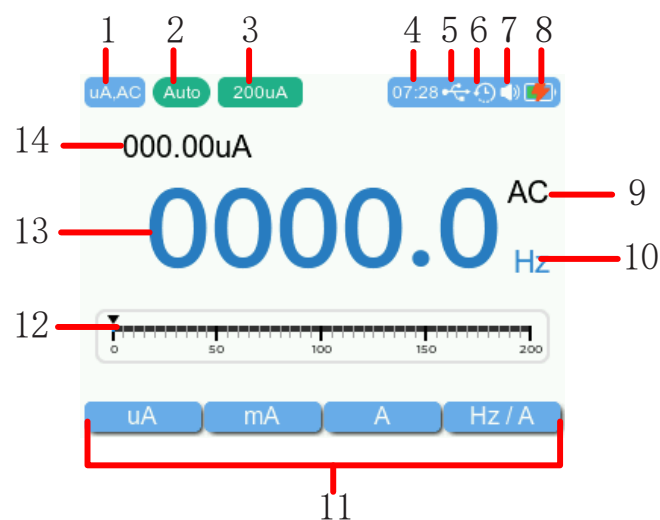
## About This Chapter

This chapter introduces the multimeter function and provides some basic examples of basic operations and how to use the menu.

## Instrument Interface

The oscilloscope meter uses four 4-mm safety banana plug input ends: **A**, **mA**, **COM**, **VΩ**  $\rightarrow$   $\nabla$   $\leftarrow$ .

Multimeter interface:



Multimeter interface

Description:

1. Measurement type indication:

Measurement type	Description
V, DC, mV, DC	DC voltage measurement
V, AC, mV, AC	AC voltage measurement
Res	Resistance measurement
Cont	On/Off measurement
Diode	Diode measurement
CAP	Capacitance measurement

Freq	Frequency measurement
uA,DC,mA,DC,A,DC	DC current measurement
uA,AC,mA,AC,A,AC	AC current measurement

2. Range indication: **Manu** means manual range; **Auto** means automatic range.
3. Current measurement range.
4. Time display.
5. Indicating that there is a USB cable inserted.
6. Automatic shutdown sign: Displays the flag when enabled. Closing will hide the identity.
7. Operation beep identification: Displays the flag when enabled. Closing will hide the identity.
8. Battery level and charge indication.
9. DC/AC/On-Off/Diode/Capacitance indication.
10. Main unit of measurement.
11. F1~F4 operation menu.
12. Range simulation strip.
13. Main measurement value.
14. Secondary measurement value.

## Measurement units

Sign	Description
M	Mega 1E+06 (1000000)
k	kilo 1E+03 (1000)
m	milli 1E-03 (0.001)
μ	micro 1E-06 (0.000001)
n	nano 1E-09 (0.000000001)

Sign	Description	Measurement type
V	Voltage	Voltage
A	Ampere	Current
Ω	Ohm	Resistance
Hz	Hertz	Frequency
%	Percent	Duty cycle
F	Farad	Capacitance

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## Input terminals

The terminal connections for the different measurement functions of the oscilloscope meter are described in the table below.







**Warning:** Before starting any measurement, observe the rotary switch position of the oscilloscope meter, and then connect the test leads to the correct terminals.



**Caution:** To avoid damaging the oscilloscope meter, do not exceed the rated input limit.

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Measurement key	Input terminals	Overload protection
	$V \Omega \rightarrow \rightarrow \rightarrow$ <b>COM</b>	750 VAC/1000 VDC
	$V \Omega \rightarrow \rightarrow \rightarrow$ <b>COM</b>	250 VAC/300 VDC
		
	<b>mA</b> <b>COM</b>	600mA/1000V fast-acting fuse
	<b>A</b> <b>COM</b>	10A/1000V fast-acting fuse

---

## Making Measurements

**Note:** When the stylus is inserted into the measurement input port **A**、**mA**、 $V \Omega \rightarrow \rightarrow \rightarrow$  , the instrument automatically switches to the default measurement type.

## Measuring AC or DC Voltage









**Warning:** Do not measure any voltage of over 1000 Vdc or 750 Vac rms to avoid instrument damage or electric shock.  
Do not apply more than 1000 Vdc or 750 Vac rms between the common terminal and the earth ground to avoid instrument damage or electric shock.

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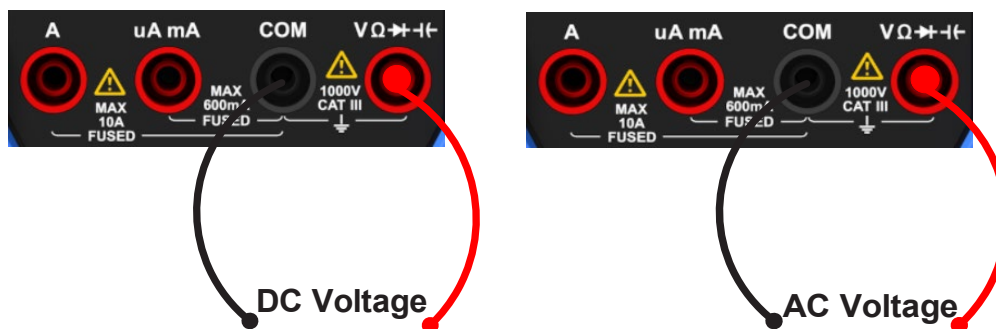


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This oscilloscope meter displays DC voltage values as well as their polarity. Negative DC voltages will display a negative sign on the left of the screen.

1. Press  to switch **DC Voltage measurement** mode, \*,**DC** will be displayed in the upper left corner(\* denotes mV or V).Then press  to switch into **AC Voltage measurement** mode, \*,**AC** will be displayed in the upper left corner(\* denotes mV or V).And then press  or  to select mV or V measurement function, press  or  to up and down measurement scales.
2. Connect the black test lead to the **COM** terminal and the red test lead to the **VΩ↔⚡** terminal.

**DC/AC Voltage Measurement connect test leads:**




3. Probe the test points and read the display.


**Note:** When measuring AC voltage, press  to cycle through frequency measuring and original measuring.

## Measuring Resistance

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 **Caution:** To avoid possible damage to your oscilloscope meter or to the equipment under test, disconnect the circuit power and discharge all high-voltage capacitors before measuring resistance.

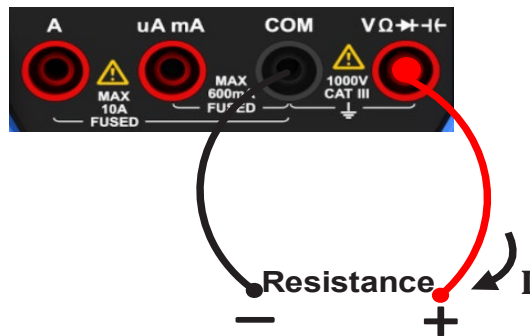
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1. Press  to enter resistance testing mode, **Res** will be displayed in the upper left corner.
2. Connect the black test lead to the **COM** terminal and the red test lead to

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the  $V\Omega \rightarrow \rightarrow \leftarrow \leftarrow$  terminal.


**Resistance Measurement connect test leads:**




3. Probe the test points and read the display.

## Measuring Continuity

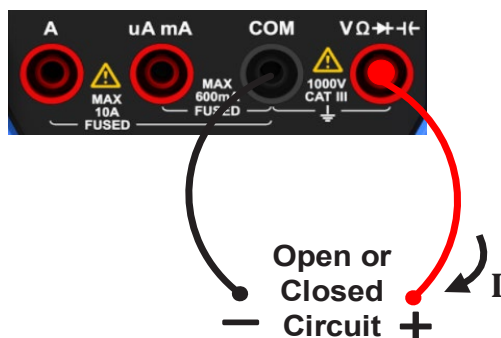
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 **Caution:** To avoid possible damage to your oscilloscope meter or to the equipment under test, disconnect the circuit power and discharge all high-voltage capacitors before testing for continuity.

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1. Press  to enter continuity testing mode, **Cont** will be displayed in the upper left corner.
2. Connect the black test lead to the **COM** terminal and the red test lead to the  $V\Omega \rightarrow \rightarrow \leftarrow \leftarrow$  terminal.

**Continuity Measurement connect test leads:**



3. Probe the test points to measure the resistance in the circuit. When the reading is below 50  $\Omega$ , the oscilloscope meter will beep continuously.


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## Measuring Diodes

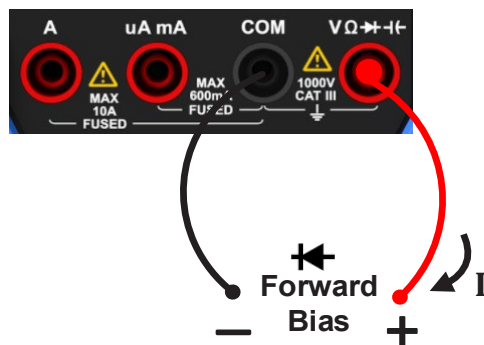


**Caution:** To avoid possible damage to your oscilloscope meter or to the equipment under test, disconnect the circuit power and discharge all high-voltage capacitors before testing diodes.

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1. Press  to enter diode testing mode, **Diode** will be displayed in the upper left corner.
2. Connect the black test lead to the **COM** terminal and the red test lead to the **VΩ→⇄** terminal.

**Diode Measurement connect test leads:**




3. Connect the red test lead to the positive terminal of the diode and the black test lead to the negative terminal .
4. Read the diode forward bias. If the test lead connection is reversed, the oscilloscope meter will display "OL".

## Measuring Capacitance



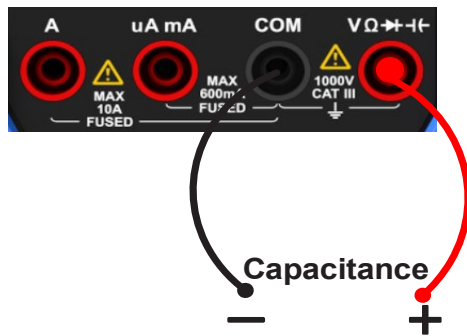
**Caution:** To avoid possible damage to the oscilloscope meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC voltage function to confirm that the capacitor is fully discharged.

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1. Press  to enter capacitance testing mode, **CAP** will be displayed in the upper left corner.
2. Connect the black test lead to the **COM** terminal and the red test lead to

the  $V\Omega \rightarrow \text{diode symbol}$  terminal.

**Capacitance Measurement connect test leads:**

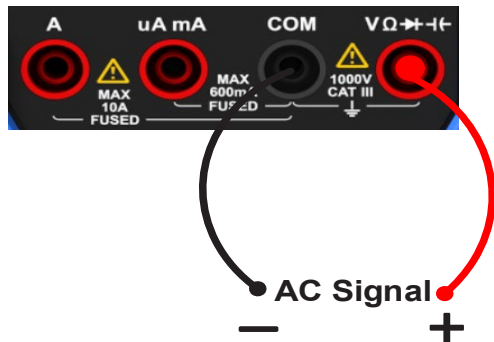


3. Probe the test points and read the display.

## Measuring Frequency

1. Press  $\text{diode symbol}$  to enter frequency measurement mode, **Freq** will be displayed in the upper left corner.
2. Connect the black test lead to the **COM** terminal and the red test lead to the  $V\Omega \rightarrow \text{diode symbol}$  terminal.

**Frequency Measurement connect test leads:**




3. Probe the test points and read the display.
4. Press **F4** to switch between the frequency and duty cycle measurements.


**Note:** When measuring AC voltage or AC current, press **F4** to cycle through frequency measuring and original measuring.

To measure the frequency of signal with large amplitude, it is recommended to

press **F4** to measure the frequency in AC voltage measurement mode.

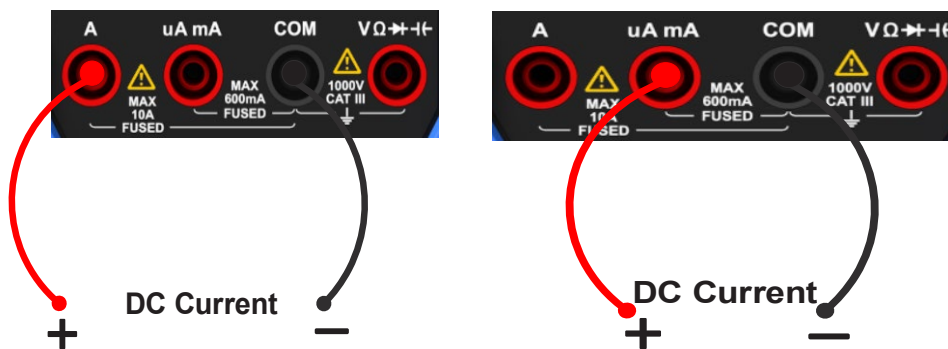
## Measuring DC or AC Current

 **Warning:** Never attempt an in-circuit current measurement where the open-circuit potential to earth is greater than 250 V. Doing so will cause damage to the oscilloscope meter and possible electric shock or personal injury.

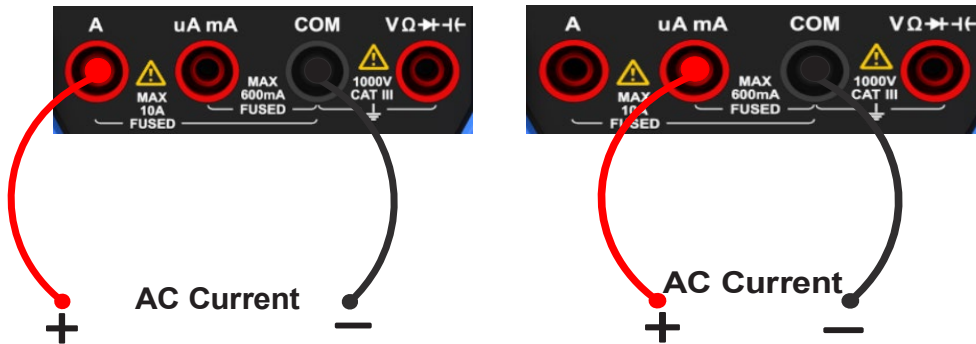
 **Caution:** To avoid possible damage to the oscilloscope meter or to the equipment under test, check the oscilloscope meter's fuse before measuring current. Use the proper terminals, function, and range for your measurement. Never place the test leads in parallel with any circuit or component when the leads are plugged into the current terminals.

1. Turn off the power of the measured circuit. Discharge all high-voltage capacitors.
2. Connect the black test lead to the **COM** terminal.
3. Press **A** to switch **DC Current measurement** mode, \*,DC will be displayed in the upper left corner(\* denotes uA、 mA or A).Then press **A** to switch into **AC Current measurement** mode, \*,AC will be displayed in the upper left corner(\* denotes uA、 mA or A).Press **F1** ~ **F3** to select uA、 mA or A. When choosing uA or mA, connect the red test lead to the mA terminal; when choosing A, connect the red test lead to the A terminal.

**DC Current Measurement connect test leads:**



**AC Current Measurement connect test leads:**



4. Disconnect the circuit path to be tested. Connect the black test lead to one side of the circuit (with a lower voltage); connect the red test lead to the other side (with a higher voltage). Reversing the leads will produce a negative reading, but will not damage the oscilloscope meter.
5. Turn on the power of the measured circuit, and read the display. Press or to the position with higher range. When "OL" is displayed, it indicates the input exceeds.
6. Turn off the power of the measured circuit and discharge all high-voltage capacitors. Remove the test leads and restore the circuit to the original condition.

**Note:** When measuring AC current, press to cycle through frequency measuring and original measuring.

## Multimeter Features

### Setting Scale

1. Press to enter automatic gear mode.
2. In the automatic gear mode, press or to enter manual gear mode.

### Setting Range

1. Press to switch into **DC Voltage measurement**, then press or to select mV or V, and then press or to up and down

measurement scales.

2. Press **≅V** to switch into **AC Voltage measurement**, then press **F1**、**F2** or **F4** to select mV、V or Hz/V, and then press **▲** or **▼** to up and down measurement scales.
3. Press **A≅** to switch into **DC Current measurement**, then press **F1** ~ **F3** to select uA、mA or A, and then press **▲** or **▼** to up and down measurement scales.
4. Press **A≅** to switch into **AC Current measurement**, then press **F1** ~ **F4** to select uA、mA、A or Hz/A, and then press **▲** or **▼** to up and down measurement scales.

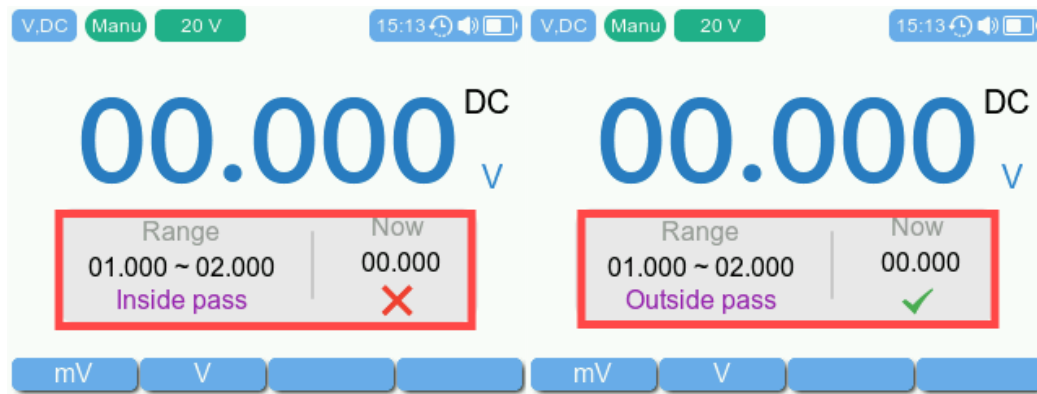
## Making MAX/MIN Measurements

Press **MAXMIN** to enter **MAX/MIN measurement**. When the button is pressed, it will automatically enter the manual gear mode. Press the button again to exit the MAXMIN mode and resume the automatic gear mode.



## Making Comparative Measurements


In multimeter mode, press **COMP** to enter comparison measurement mode. (Before using this function, it is necessary to set the corresponding comparison range. For detailed instructions on setting up, please refer to page 29, "System Settings".)



- When the condition is met for being outside the range: If the current measurement value displayed on the main screen is outside the comparison range, it will be considered as a pass.
- When the condition is met for being outside the range: If the current measurement value displayed on the main screen is inside the comparison range, it will be considered as a fail.
- When the condition is met for being inside the range: If the current measurement value displayed on the main screen is inside the comparison range, it will be considered as a pass.
- When the condition is met for being inside the range: If the current measurement value displayed on the main screen is outside the comparison range, it will be considered as a fail.

## Value Hold Mode

The value hold mode keeps the current reading on the display.

1. Press , the current reading will be maintained, **HOLD** will be displayed. Simultaneously, the device will continue to display the actual measurement value in the status bar at the top of the main screen.
2. Press it again to exit the mode.





## Making Relative Measurements

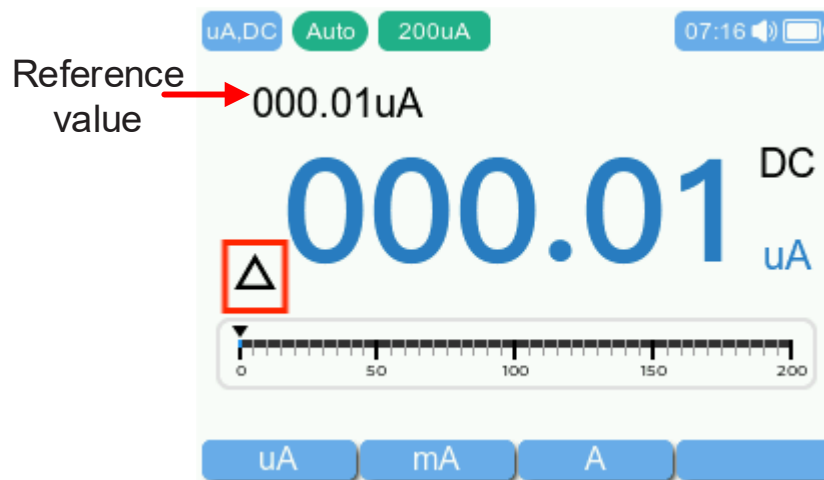
When making relative measurements, reading is the difference between a stored reference value and the input signal.

1. Press **REL** to enter the relative mode,  $\Delta$  will be shown on the display.

The measurement value when pressing **REL** as the reference value.

In this mode,  $\Delta(\text{current reading}) = \text{input value} - \text{reference value}$ .

2. Press it again to exit the mode.



In relative measurement, the manual range mode will be activated automatically. (When the range is exceeded, the relative value mode cannot be turned on, that is, this function is only available under the manual range mode.)

# 5.How to Use the Oscilloscope

## Introduction to the User Interface of the Oscilloscope

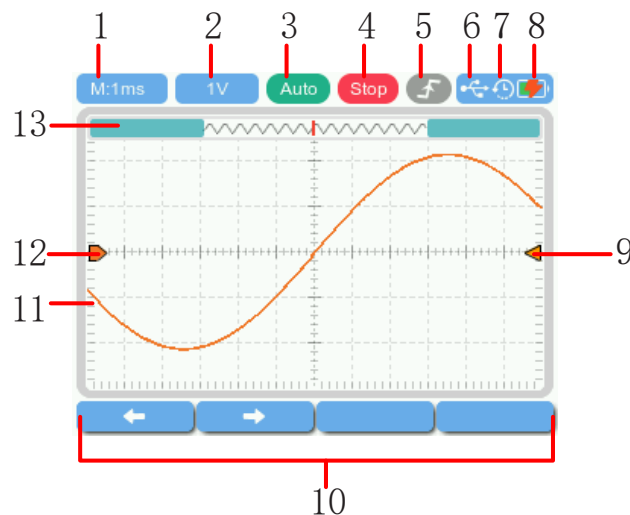


Figure 3-1: Oscilloscope Interface

Description:

1. Time base (In the vertical direction, the per grid denotes time).
2. Amplitude (In the vertical direction, the per grid denotes voltage or current).
3. Trigger operation mode:

Auto: In this trigger mode, if the specified trigger condition is not detected, the oscilloscope will initiate a forced triggering and acquisition process to display the waveform. This triggering method is suitable for unknown signal levels or when displaying DC signals, as well as when trigger conditions occur frequently and there is no need for forced triggering. When the base time is greater than or equal to 100 milliseconds, enter the scanning mode.

Normal: In this trigger mode, the oscilloscope only performs triggering and acquisition when the specified trigger condition is detected. This triggering method is applicable to low repetition rate signals, selective capture of specific events determined by trigger settings, and ensuring a stable display by preventing automatic triggering by the oscilloscope.

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Single: In this trigger mode, the oscilloscope performs a single triggering and acquisition only when the specified trigger condition is detected, and then stops. This triggering method is suitable for situations where a single capture of a specific event is needed for subsequent analysis (enabling translation and scaling of the current displayed waveform, with subsequent waveform data not overwriting the current waveform). After a single triggering, the oscilloscope enters the "STOP" state.

4. The trigger status indicates the following information:
  - Trig: A trigger has been detected and post trigger information is being collected.
  - Ready: All pre-trigger data have been obtained and the oscilloscope is ready.
  - Scan: Continuously collect and display waveform data.
  - Stop: Stop collecting waveform data.
5. Trigger edge type.
6. It indicates that there is a USB disk connecting.
7. Automatic shutdown sign: Displays the flag when enabled. Closing will hide the identity.
8. Battery level and charge indication.
9. Trigger level horizontal position.
10. F1~F4 operation menu.
11. Waveform display area.
12. Channel waveforms.
13. Waveform scroll bar.

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# Measuring System

## Automatic Measurement

In oscilloscope mode, press  can display automatic measurement value, the screen displays six measurement types in the lower left corner: Freq/Max/Min/Vpp/Avg and Rms.

### The automatic measurement of voltage parameters

The oscilloscopes provide automatic voltage measurements including Avg, Vpp, Rms, Max, Min and Vamp. Figure 3-4 below shows a pulse with some of the voltage measurement points.

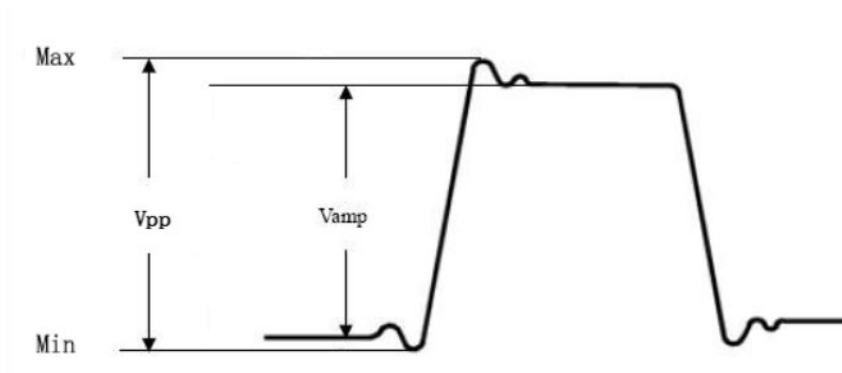


Figure 3-2

**Avg:** <1 cycle: The whole displayed waveform is used for calculation;

>1 cycle: A waveform of n cycles is used for calculation.

**Vpp:** Peak-to-Peak Voltage.



**Rms:** <1 cycle: The whole displayed waveform is used for calculation;

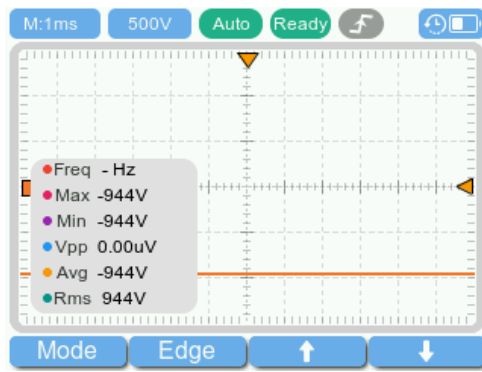
>1 cycle: A waveform of n cycles is used for calculation.

**Max:** The most positive peak voltage measured over the entire waveform.

**Min:** The most negative peak voltage measured over the entire waveform.

### Measurement:

1. Press  to switch into oscilloscope mode.
2. Press  to open or close automatic measurement function. The measurement values of the waveform will be displayed in the lower left corner of the screen.



3. Press to enter voltage measurement, press or to select **mV** or **V** measurement unit, and then press or to up and down measurement gear, press or to adjust time base gear.
4. Press to enter current measurement, press ~ to select **uA**、**mA** or **A** measurement unit, and then press or to up and down measurement gear, press or to adjust time base gear.
5. Press to enter pause mode, if you press or can horizontally shift the waveform and press or to zoom in or out the waveform.
6. Press , automatically setting the trigger level to half of the current signal's Vpp.

## Trigger System

The trigger determines when the oscilloscope starts to acquire data and display waveforms. Once the trigger is set correctly, it can convert an unstable display into a meaningful waveform.

When the oscilloscope starts to acquire data, it first acquires enough data to draw the waveform on the left side of the trigger point. The oscilloscope continuously acquires data while waiting for the trigger condition to occur. When a trigger is detected, the oscilloscope continuously acquires enough data to draw a waveform on the right of the trigger point.



The trigger mode of this series of oscilloscopes is edge trigger.


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The edge trigger mode is to trigger on the trigger electrical level of the edge of the input signal, that is, trigger on the rising and falling edges of the input signal.

Press  to enter edge trigger menu.

The description of the trigger system setting menu is as follows:


Function Menu	Setting	Description
Mode	Auto	Waveforms can be acquired without detecting trigger conditions.
	Normal	The waveform is acquired only when the trigger conditions are met.
	Single	When a trigger is detected, a waveform is sampled and then stopped.
Edge		Trigger on the rising edge of the signal.
		Trigger on the falling edge of the signal.

**Mode:** Press  can cycle through Auto、Normal or Single.

**Edge:** Press  can cycle through rising edge and falling edge.

**Trigger level position:** Press  or  can up and down trigger level position.

## 6. Save and Recall Picture

1. **Save picture:** Press  button will initiate the process of capturing a screenshot. Upon completion, a prompt will appear containing information about the directory where the screenshot is saved. By default, it is possible to save up to 20 screenshots, with new captures overwriting older ones once the limit is reached.








**Note:** The dot next to the battery will display orange if the storage space is insufficient, and it will display green if the storage space is adequate.



2. **Recall picture:** Upon connecting the USB cable to a computer, to open the saved image, select the path where the image is stored.

## 7. System Settings


Press  to enter the system function menu. Press  or  to select the desired function menu, and then press  or  to select desired setting.

### □ **Date|Time**







Select **Date|Time** page, and you can do the following.

The description of the option is as follows:

Page options	Description
Date,Time	Set the required time.
Hour 12h	Set the display mode to 12-hour format.
Date Tran	Set the time display format.

1. Press the power button  can display the hidden time icon; press any button, can hide the date.



2. **Time setting:** Select **Date,Time** option. Press  or  to select year、month、day、hour、minute and second, and then press  or  to set required time.
3. **12-hour format setting:** Select **Hour 12h** option. Press  the time display will be in the 12-hour format and press it again will switch to 24-hour format.
4. **Date display settings:** Select **Date Tran** option. Press  the date will be displayed in the format of DD/MM/YYYY (day/month/year),and press it again, the date will be displayed in the format of YYYY/MM/DD.





## □ Display


Select **Display** page, and you can do the following.

The description of the option is as follows:

Page options	Description
Dark Mode	Set the multimeter display mode
Brightness	Adjust brightness High, Mid or Low.

1. **Multimeter display mode setting:** Select **Dark Mode** option, and then press , the "Reboot device Press again" prompt box will pop up on the screen. Pressing the  button at the same time will restart the device and apply the new display mode. Press any key to undo the action currently being performed.






2. **Brightness setting:** Select **Brightness** option, and then press , the brightness varies between Low, Mid, and High.


## □ Sound

Select **Sound** page, and you can do the following.

The description of the option is as follows:

Page options	Description
Voice	Set the key operation prompt tone.
Volume	Set the volume.
Warning	Set alarms.

1. **Voice setting:** Select **Voice** option, and then press  will produce a sound prompt; press it again will be no sound prompt upon pressing a key.
2. **Volume setting:** Select **Volume** option, press  will increase volume; press  will decrease volume. The sound is set to maximum by default.





3. **Warning setting:** Select **Warning** option, and then press  an alarm notification will be enabled; press it again will there will be no alarm notification(Such as: probe socket detection.).

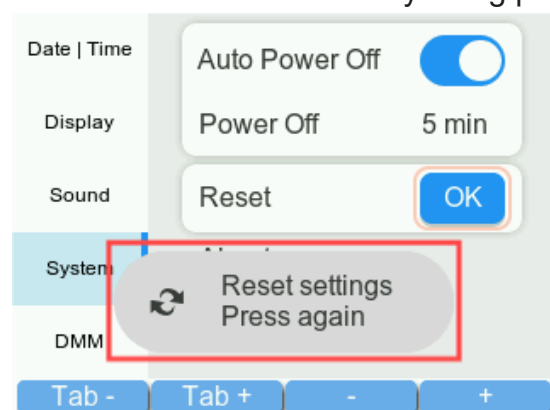
## □ **System**

Select **System** page, you can do the following.

The description of the option is as follows:

Page options	Description
Auto Power Off	Set automatic shutdown.
Power Off	Set the automatic shutdown time.
Reset	Restore default setting.
About	Display information about the instrument.

1. **Automatic shutdown setting:** Select **Auto Power Off** option, and then press  will enable automatically shut down. When enabled, the device will automatically power off after a specified period of inactivity; pressing the button again will require manual shutdown.
2. **Automatic shutdown time setting:** Select **Power Off** option. Press  the shutdown time will change between 5 min and 30 min.
3. **Reset setting:** Select **Reset** option, and then press , "Reset settings Press again" will pop up on screen, press  at the same time, the device will restart and restore default setting. Press any key to undo the action currently being performed..






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□ **DMM**

Select **DMM** page, and you can do the following:

The description of the option is as follows:

Page options	Description
Cont SENS	Can not be set.
Comp Range	Set comparison range.
Out Range Pass	Set the comparison pass condition range as outside the interval.

1. **Set on-off range:** Select **Comp Range** option, and then press  or  can modify the range of the interval (left and right intervals will be automatically determined).
2. **Set out range pass:** Select **Out Range Pass** option, and then press  to enable or disable the option. Enabling this option sets the comparison pass condition as outside the interval. Disabling this option sets the comparison pass condition as inside the interval.

## 8. Technical Specifications

Standard conditions: The environment temperature is 18°C to 28°C, the relative humidity is less than 80%.

**Note:**

When measuring AC voltage, accuracy guarantee range is 10% to 100% of the range.

When measuring DC voltage, AC/DC current or capacitance, accuracy guarantee range is 5% to 100% of the range.

### Multimeter Specification

Function		Measurement Range	Resolution/ Frequency Range	Accuracy $\pm$ (% of reading + LSB)	
DC Voltage (V)	mV	20.000mV	0.001mV	$\pm(0.1\%+20\text{dig})$	
		200.00mV	0.01mV	$\pm(0.1\%+6\text{dig})$	
	V	2.0000V	0.1mV	$\pm(0.1\%+5\text{dig})$	
		20.000V	1mV		
		200.00V	10mV		
		1000.0V	0.1V	$\pm(0.15\%+5\text{dig})$	
AC Voltage (V)	mV	20.000mV	0.001 mV	VRMS Freq range: 40Hz-1000Hz	$\pm(0.6\%+10\text{dig})$
		200.00mV	0.01mV		
	V	2.0000V	0.1mV		
		20.000V	1mV		
		200.00V	10mV		
		750.0V	0.1V		$\pm(0.8\%+10\text{dig})$
DC Current (A)	$\mu\text{A}$	200.00 $\mu\text{A}$	0.01 $\mu\text{A}$	$\pm(0.6\%+10\text{dig})$	
		2000.0 $\mu\text{A}$	0.1 $\mu\text{A}$	$\pm(0.5\%+10\text{dig})$	
	mA	20.000mA	1 $\mu\text{A}$	$\pm(0.6\%+10\text{dig})$	
		200.00mA	10 $\mu\text{A}$	$\pm(0.5\%+10\text{dig})$	
	A	2.0000A	100 $\mu\text{A}$	$\pm(1.0\%+10\text{dig})$	
		10.000A <sup>[1]</sup>	1mA	$\pm(2.0\%+10\text{dig})$	
AC Current (A)	$\mu\text{A}$	200.00 $\mu\text{A}$	0.01 $\mu\text{A}$	VRMS Freq range: 40Hz-1000Hz	$\pm(0.8\%+10\text{dig})$
		2000.0 $\mu\text{A}$	0.1 $\mu\text{A}$		
	mA	20.000mA	1 $\mu\text{A}$		
		200.00mA	10 $\mu\text{A}$		

	A	2.0000A	100μA		±(1.5%+10dig)
		10.000A <sup>[1]</sup>	1mA		±(2.5%+10dig)
Resistance(Ω)		200.00Ω	0.01Ω	±(0.8%+10dig)	
		2.0000kΩ	0.1Ω	±(0.3%+5dig)	
		20.000kΩ	1Ω	±(0.3%+5dig)	
		200.00kΩ	10Ω		
		2.0000MΩ	100Ω	±(0.5%+5dig)	
		20.000MΩ	1kΩ		
		100.00MΩ	10kΩ	±(5.0%+10dig)	
Capacitance(F)		2.000nF	1pF	±(5.0%+10dig)	
		20.00nF	10pF	±(3.0%+10dig)	
		200.0nF	100pF		
		2.000μF	1nF		
		20.00μF	10nF		
		200.0μF	100nF		
		2.000mF	1μF		
		20.00mF <sup>[2]</sup>	10μF		
Frequency <sup>[3]</sup> (Hz)		200.00Hz	0.01Hz	±(0.1%+5dig)	
		2.0000kHz	0.1Hz		
		20.000kHz	1Hz		
		200.00kHz	10Hz		
		2.0000MHz	0.1kHz		
		20.000MHz	1kHz		
Duty Cycle <sup>[4]</sup> (%)		0.1% -99.9% (Typical: Vrms=1 V, f=100Hz)	0.1%	±(1.2%+3dig)	
		0.1%-99.9%(≥ 1 kHz)		±(2.5%+10dig)	
Diode		3.0000V	0.0001V	±(1.0%+10dig)	
Continuity		1000.0Ω	0.1Ω		
Maximum Reading	20000				

- [1] When measuring current, for 10A the measuring duration should not be over 2 minutes within 10 minutes, and in this 10 minutes, no other current should flow through except within the measuring duration.
- [2] When measuring capacitance, for the 20.00mF range, the measuring duration should be over 30 seconds.
- [3] When measuring frequency, the typical waveform is Square or Sine. The signal meets the following conditions:

Frequency	Amplitude(rms)
1 Hz – 20 MHz	$\geq 1 \text{ V}$

- [4] When measuring duty cycle, the typical waveform is Square.

**Note:** when measuring resistance and capacitance, the influence of the resistance reactance of the pen itself on the measured value should be considered.

## Oscilloscope Specification

Characteristics	Instruction
Analog bandwidth	1MHz (only ACV scale)
Maximum sample	5.0MSa/s
Channel	1
Input impedance	approximately 10M $\Omega$
Time base range	2.5us~10s/grid
Time base accuracy	$\pm(0.01\% + 0.1\text{div})$
Voltage vertical sensitivity range	30mV~500V/grid
Current vertical sensitivity range	100 $\mu\text{A}$ ~5A/grid
Vertical amplitude accuracy	$\pm(5\% + 0.2\text{div})$
Maximum voltage limit	1000V DC+AC Peak value
Maximum current limit	15A DC+AC Peak value
Trigger mode	Auto/Normal/Single
Autoset	Time base/Vertical amplitude/Trigger value
Trigger edge	Rise edge/Fall edge
Measurement function	Vmax, Vmin, Vpp, Vavg, Vrms, Freq

**Note:** The signal is within 5dB attenuation with an analog bandwidth of up to 1MHz.

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## General Specification

Characteristics	Instruction
Sleep Mode	√
Low battery indication	√
Backlight	√
Input Protection	√
Input Impedance	≥ 10 MΩ
Battery	Single 18650 3.7v 2600mA
Display	2.8 inch IPS:320*240 resolution
Weight (without package)	Approx. 0.33kg(without battery)
Dimension (L x W x D)	188mm x 93mm x 41.5mm
Working temperature	0°C to 40°C
Storage temperature	— 10°C to 60°C
Relative Humidity	≤ 80%
Altitude	Operating: 3,000 meters Non-operating: 15,000 meters

### Interval Period of Adjustment:

One year is recommended for the calibration interval period.

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## 9. Appendix

### Appendix A: List of Accessories

- 1 set of probe leads
- 1 quick guide
- 1 USB-TYPE C cable
- Soft storage bag



Quick Guide



USB Cable



Multimeter  
Leads



Soft Bag

### Appendix B: Maintenance and Cleaning

#### General maintenance

Do not store or place the instrument in a place where the LCD screen will be exposed to direct sunlight for long periods.

**Caution:** Do not let spray, liquid or solvent touch the instrument to prevent damage to the instrument.

#### **Cleaning:**

Check the instrument frequently according to the operation. Clean the external surface of the instrument as follows:

1. Wipe any dust outside the instrument with a soft cloth. When cleaning the LCD, be careful not to scratch the transparent LCD display screen.
2. Wipe the instrument with a moist soft cloth. Please disconnect the power supply. Stubborn marks can be removed using a mild detergent. Do not use any abrasive chemical cleaning agent to avoid damaging the instrument or probe



**Warning:** Please make sure the instrument is dry before re-energizing to avoid electrical short circuit or personal injury caused by moisture.



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## Charging the Battery

During the long-term storage of the device, the battery may be too low due to the self-discharge of the lithium battery and the device cannot be turned on. This is a normal phenomenon.

To pre-charge the device for 0.5 to 1 hour (depending on the storage time) before turning it on. In addition, if the device is not used for a long time, it is recommended to charge it at regular intervals to avoid over-discharge of the lithium battery.

### Battery Charging

The lithium battery may not be fully charged when delivered. To fully charge may take up to 2.5 hours resulting in a peak discharge battery life of about 24 hours. The power supply and battery indicator symbols in the upper right corner of the screen are explained as follows:



symbol indicates the power-on charging status;



symbol indicates battery power charge rating;



symbol indicates that there is only about five minutes of use time left.

Please charge as soon as possible when this low battery warning displays to avoid damage to the battery.

### Charging Method

Connect the oscilloscope meter to a suitable USB power source through a USB charge cable for charging (pay attention to the load capacity of the power supply equipment to avoid possible damage).

#### Note

To avoid overheating of the battery during charging, the ambient temperature must not exceed the allowable value given in the technical specifications.



#### INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT.

When this product has reached the end of its life it must be treated as Waste Electrical & Electronic Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used. Contact your local authority for details of recycling schemes in your area.



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