User Manual

DM40 Multimeter User Manual

Touchable Multimeter 3-IN-1

User Manual

ALIENTEK

Revision History

Version	Date	Modify Contents
V1.0	2024/12/07	First release
V1.1	2024/12/11	Added firmware upgrade, custom boot logo, quick screenshot instructions
V1.2	2024/12/13	Added multimeter measurement settings instructions, added AUTO+ mode
V1.3	2024/12/25	Added data record, resistor mode settings, shockproof mode, slide to shutdown
V1.4	2025/01/18	Added mode memory, quick mode switch of resistor, countdown shutdown

Contents

Thank you for purchasing this product. To fully understand its features and operation, we recommend reading this manual carefully before use.

Safety Instructions (Must Read)

1， Before using DM40, please check carefully if the shell has cracks or defects, and ensure the measurement ports and accessories are normal.
2， DM40 integrates a rechargeable battery. For safety and measurement stability, please do not measure while charging. Low battery reminders may affect accuracy. Please charge promptly.
3， Please select the correct measurement port, range, and scale to avoid damaging the instrument or causing personal injury！
4， Hold the probe at the protected position. Do not hold the metal part for measurement！
5， Do not disassemble the case at will or measure while the case is open.
6， Do not use in environments with flammable or explosive gases/materials or in damp conditions.
7， For voltage measurement, when used for DCDC or high voltage above 36V measurement, it is recommended to use AUTO+ mode to skip the mV range (to avoid mismeasurement, sparking, and protection) and start measurement from the V range.

1，Product Introduction

The DM40 digital multimeter is the first high-performance 3-in-1 multimeter launched by Guangzhou Xingyi Electronic Technology Co., Ltd. Its main features are as follows:

① Integrated multimeter, oscilloscope, and signal generator, featuring comprehensive functions and convenient measurement.
② Equipped with a 3.5-inch 480*320 IPS capacitive touchscreen, providing delicate display and convenient interaction.
③ 4-5/6 multimeter with a count of up to 60000 (C version), TRMS true RMS measurement, precise and reliable.
④ Automatic mV/V range and innovative uA/mA/A range design for quick and efficient measurement.
⑤ AC+DC mixed measurement (B/C versions), no signal escapes detection.
⑥ Super diode measurement with multi-segment beep design, quick response, and support for resistance (<1KΩ) measurement.
⑦ Supports resistance, capacitance, continuity, frequency, temperature, and other measurements.
⑧ Supports manual (V/A/Ω)/automatic range, RLE relative measurement, extreme value measurement, data hold.
⑨ Supports trend chart display for efficient data analysis with 3 adjustable time bases.
⑩ Oscilloscope with 50MSa/s sampling rate, 10MHz bandwidth, and 10-bit vertical resolution.
⑪ Oscilloscope supports multiple trigger modes and types, as well as FFT and ABS operations.

⑫ Signal generator supports sine wave, sawtooth wave, triangle wave, and square wave up to 10MHz.

DM40 Basic Parameters:

Basic Information	
Model	DM40A、DM40B、DM40C
Screen	3.5'(480*320) IPS Touchscreen
Battery Life	≈12H(Multimeter) ≈10H(Oscilloscope)
Dimensions	140 * 83 * 25mm
Weight	≈260g
Interface	USB TypeC/MCX Socket/Banana Jack Socket
Conditions	Temperature 0~40℃、Humidity <75%

Table 1.0 DM40 Basic information

DM40 Multimeter Technical Parameters:

Multimeter Technical Parameters				
Model	DM40A	DM40B	DM40C	
Function	Range			Accuracy
DC Voltage	400mV/4V/40V /400V/1000V	500mV/5V/50V /500V/1000V	600mV/6V/60V /600V/1000V	±(0.03%+5d)
AC Voltage	400mV/4V/40V /400V/750V	500mV/5V/50V /500V/750V	600mV/6V/60V /600V/750V	±(0.3%+15d)
DC Current	400uA/4000uA /40mA/400mA	500uA/5000uA /50mA/500mA	600uA/6000uA /60mA/600mA	±(0.15%+5d)
	4A/10A	5A/10A	6A/10A	±(0.2%+5d)
AC Current	400uA/4000uA /40mA/400mA	500uA/5000uA /50mA/500mA	600uA/6000uA /60mA/600mA	±(0.5%+15d)
	4A/10A	5A/10A	6A/10A	±(0.75%+15d)
Resistor	400Ω/4KΩ/40KΩ /400KΩ/4MΩ	500Ω/5KΩ/50KΩ /500KΩ/5MΩ	600Ω/6KΩ/60KΩ/600KΩ/6MΩ	±(0.1%+5d)
	40MΩ	50MΩ	60MΩ	±(0.2%+10d)
Capacitance	4nF/40nF/400nF /4uF/40uF	5nF/50nF/500nF /5uF/50uF	6nF/60nF/600nF /6uF/60uF	±(2.5%+30d)
	400uF/4mF/40mF	500uF/5mF/50mF	600uF/6mF/60mF	±(3.5%+30d)
Frequency	10Hz~40MHz	10Hz~50MHz	10Hz~60MHz	±(0.01%+5d)
Temperature	-40℃~1000℃(Standard probe range -20℃~300℃) -40℉~1832℉			±(1.0%+5℃) ±(1.5%+5℉)
Continuity	0Ω~1KΩ			±(0.2%+5d)
Diode	0V~3.0V, 0Ω~1KΩ			±(1%+5d)
AC Response	10KHz			

Table 1.1 Multimeter Technical Parameters

DM40 Oscilloscope Technical Parameters:

Oscilloscope Technical Parameters			
Sample Rate	50MSa/S	Input lmpedance	1MΩ
Bandwidth	10Mhz	Timebase Mode	YT/ROLL
Memory Depth	64Kpts	Sweep Mode	Auto/Normal/Single
Time Scale	100ns~50s	Trigger Type	Rising/Falling
Vertical Scale	10mV~10V /div(X1)	Persistence	OFF /Min/1S/∞
Resolution	10bit	Math	FFT/ABS
Coupling	AC、DC	Measurement items	20 types

Table 1.2 Oscilloscope Technical Parameters

DM40 Signal Generator Technical Parameters:

Signal generator Technical Parameters					
Wave out	Sine Wave	Sawtooth Wave	Triangle Wave	Square Wave	
Frequency	1Hz~50KHz				100KHz~10MHz
Amplitude	0.5V~3.0Vpp				3.0Vpp
Duty	Not Adjustable			0~100%	Not Adjustable

Table 1.3 Signal Generator Technical Parameters

DM40 Adjustable MCX Probe Parameters:

Adjustable MCX Probe Parameters				
Attenuation Ratio	Bandwidth	Input Impedance	Input Capacitance	Maximum Voltage
X1	20MHz	1MΩ ±2%	50pF±20pF	40VRMS CAT II
X10	140MHz	10MΩ ±2%	15pF±5pF	400VRMS CAT II

Table 1.4 Adjustable MCX Probe Parameters

2, Quick Start

2.1 Appearance Description

图 2.1.1 DM40 外观和接口

Description

① Power Button (Long press to turn on/off, double-click to lock/unlock touch)
② TypeC Port (For charging and USB communication, input voltage <5.2V)
③ Charging Indicator (Blue light when charging, off when fully charged)
④ MCX Signal Generator Port
⑤ MCX Oscilloscope Port
⑥ 3.5" (480*320) IPS Touchscreen
⑦ Voltage, Resistance, Capacitance, Continuity, Diode, Frequency, Temperature Measurement Ports (Black COM is common)
⑧ Current Measurement Port (Black COM is common)
⑨ Multi-function Touch Buttons (MENU, RUN, AUTO, MF)

2.2 Multimeter Measurement Interface

The multimeter interface displays rich content: top status bar; left 4 multi-function touch buttons; middle for various measurement displays; bottom 6 touch buttons to switch 8 measurement functions; as shown in Figure 2.2.1.

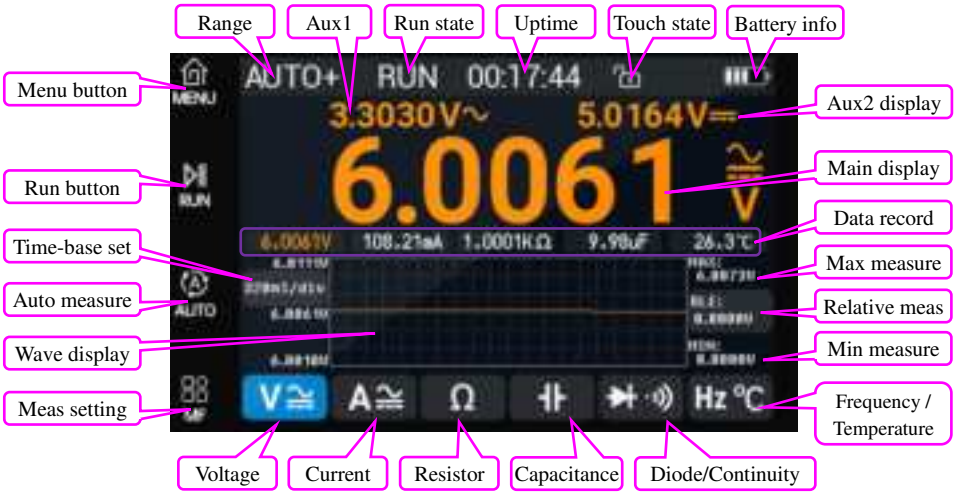


图 2.2.1 万用表测量界面

2.2.1, Status Bar Description

Range Indication: AUTO range and manual range (only for voltage, current, resistance).

Running Status: RUN for running status, HOLD for data hold.

Touch Lock/Unlock: Double-click the power button to lock/unlock touch function. After locking, touch is invalid. Single-click the power button can still switch measurement modes within the current mode.

Uptime: Records uptime (in hours/minutes/seconds).

Battery Info: Displays battery level when not charging, charging progress when charging (Do not measure while charging to avoid mismeasurement).

2.2.2, Left Touch Buttons

MENU: Click to return to the function interface or measurement interface.

RUN: Click to toggle RUN/HOLD mode. HOLD stops the interface from refreshing (except for Uptime).

AUTO: Click to restore automatic range and turn off RLE function.

MF: Enter/exit measurement settings (only for V/A/Ω). For voltage/current, select range first and then AC/DC measurement. For resistance, select range and return to the measurement interface.

2.2.3, Value of measurement

Aux1: AC mode displays frequency, AC+DC mode displays AC component, temperature mode displays machine temperature.

Aux2: AC mode and frequency mode display duty, AC+DC mode displays DC component, diode mode displays equivalent resistance, temperature mode displays Fahrenheit.

Main display: Displays measurement value and units.

RLE function: In non-OL and data hold states, click RLE button to enable RLE function and enter manual range. Records main display value to RLE. Then main display subtracts the RLE value. Click once to update. Click the AUTO button/switch measure mode/long-press the RLE button to

turn off this function and restore automatic range.

MAX/MIN: Records the maximum and minimum measured values. Clears after changing measurement modes;

Waveform Display: Synchronously displays the main display value. The waveform auto-scales, with horizontal*vertical=20*6 grids. Time base options are 160mS/320mS/640mS. Default is 320mS/div;

2.2.4, Mode Setting Buttons

Voltage Measurement: Cycle through DCV mode, ACV mode, AC+DC mode (only DM40B/C).

Current Measurement: Cycle through DCA mode, ACA mode, AC+DC mode (only DM40B/C).

Resistance Measurement: Click to cycle through offline and online resistance measurement. Online measurement is indicated by Ω with subscript ON.

Capacitance Measurement: Sets to capacitance measurement mode.

Diode/Continuity Measurement: Cycle through diode and continuity measurement.

Frequency/Temperature Measurement: Cycle through frequency and temperature measurement.

Note: Switching measurement modes restores AUTO/AUTO+ range and turns off RLE function.

2.2.5, Data Recording

DM40 supports screen data recording. In non-OL state, short-press the main display number area to record and update data once. A short beep indicates recording. The most recently updated data is orange, and others are white. Supports up to 5 sets of data. Older data is overwritten. Long-press the main display area for 1s to clear all records. A long beep indicates clearing.

2.3 Measurement Mode Description

Measurement Mode Description:

Measurement Mode Description		
Mode Category	Item Category	Unit+Symbol
Voltage Measurement	DCV(DC Voltage Measurement)	mV/V ⎓
	ACV(AC Voltage Measurement)	mV/V ~
	AC+DC Mixed Measurement(DM40B/C)	mV/V ≅
Current Measurement	DCA(DC Current Measurement)	uA/mA/A ⎓
	ACA(AC Current Measurement)	uA/mA/A ~
	AC+DC Mixed Measurement(DM40B/C)	uA/mA/A ≅
Resistance Measurement	Resistance Measurement	Ω/KΩ/MΩ Ω

Capacitance Measurement	Capacitance Measurement	nF/uF/mF
Diode Measurement	Diode Voltage Drop Measurement	V
	Resistance Measurement	Ω
Continuity Measurement	Continuity Measurement	Ω
	Resistance Measurement	
Frequency Measurement	Frequency Measurement	Hz/KHz/MHz
	Duty Measurement	%
Temperature Measurement	Temperature Measurement	℃/℉

Table 2.3.1 Measurement Mode Description

2.4 Measurement Port Description

(Red Terminal)	1. AC/DC voltage measurement 2. Resistance measurement 3. Continuity measurement 4. Diode measurement 5. Capacitance measurement 6. Frequency measurement 7. Temperature measurement.
COM (Black Terminal)	**Common port for all measurements**
A mA uA (Red Terminal)	**Dedicated port for current measurement, 10A(Max)** Built-in 10A ceramic fuse. Replace with the same model if burned

Figure 2.4.1 Measurement Port Description

2.5 Measurement Methods

2.5.1 Voltage Measurement

① Click the voltage button (V⎓) to enter voltage measurement mode, Default is DC measurement. Cycle through DCV/ACV/AC+DC measurement by clicking (only DM40B/C).
② Connect the black probe to the black **COM** port and the red probe to the red **VΩHz** port.
③ Connect the probes to the circuit under test and observe the measured value on the screen. OL indicates out of range.
Note: Do not exceed the maximum measure value. Use auto range if unsure of the voltage range.

2.5.2 Current Measurement

① Click the current button (A⎓) to enter current measurement mode. Default is DC measurement. Cycle through DCA/ACA/AC+DC measurement by clicking (only DM40B/C).
② Connect the black probe to the black **COM** port and the red probe to the red **A mA uA** port.

③ Connect the probes to the circuit under test and observe the measured value on the screen. OL indicates out of range.

Note: Do not exceed the maximum measure value(10A). Use auto range if unsure of the current range.

2.5.3 Resistance Measurement

① Click the resistance button（Ω）to enter resistance measurement mode.

② Connect the black probe to the black **COM** port and the red probe to the red **VΩHz** port.

③ Connect the probes to the resistor under test and observe the measured value on the screen. OL indicates out of range.

Note: It is recommended to switch to online measure mode for online measurement.

2.5.4 Capacitance Measurement

① Click the capacitance button（⊣⊢）to enter capacitance measurement mode. Capacitance measurement only supports automatic range.

② Connect the black probe to the black **COM** port and the red probe to the red **VΩHz** port.

③ Discharge the capacitor in advance, then connect the probes to the capacitor under test and observe the measured value on the screen. OL indicates out of range. Testing large mF capacitors takes longer, which is normal.

Note: Do not perform voltage measurement in this mode to avoid damaging the instrument.

2.5.5 Diode/Continuity Measurement

① Click the diode/buzzer button（）to enter diode measurement mode. Click again to switch to continuity measurement.

② Connect the black probe to the black **COM** port and the red probe to the red **VΩHz** port.

③ Connect the probes to the component under test. Diode measurement supports 4-segment beeps (<0.02V long beep, <0.45V two short beeps, <0.75V one short beep, <1.5V urgent three short beeps). Maximum voltage drop display is around 3.1V. OL is displayed if exceeded. Also supports resistance measurement within 1KΩ,OL displayed if exceeded. Approximately within 30 Ω, the buzzer beeps continuously。

Note: Do not perform voltage measurement in this mode to avoid damaging the instrument.

2.5.6 Frequency/Temperature Measurement

① Click the frequency/temperature button（Hz℃）to enter frequency measurement mode. Click again to switch to temperature measurement mode.

② For frequency measurement, the recommended input signal amplitude is within 20Vrms, with a limit of 250Vrms. Connect the black probe to the black **COM** port and the red probe to the red **VΩHz** port. Connect the probes to the signal under test and observe the measured value on the screen. OL indicates out of range. Aux2 shows signal duty cycle.

③ For temperature measurement, connect the thermocouple negative terminal to the black **COM** port and the positive terminal to the red **VΩHz** port. Contact the probe with the surface of the object under test and observe the measured value in Celsius, OL indicates out of range. Aux1 shows machine temperature. Aux2 shows measured value of thermocouple in Fahrenheit.

Note: Do not perform voltage measure in temperature mode to avoid damaging the instrument.

2.6 Measurement Settings

2.6.1 Voltage and Current Measurement Settings

Taking DM40C voltage measurement setting as an example: Click the voltage V measurement button to enter voltage measurement mode, then Click the MF button to enter the settings interface (similar for current measurement settings).

Explanation:

DM40C include 5 manual ranges (600mV/6V/60V/600V/1000V) and two automatic ranges (AUTO and AUTO+). The difference is that AUTO is a fully automatic range, switching between mV and V ranges automatically, while AUTO+ is a V range automatic range, only switching within V ranges. AUTO+ mode avoids relay flickering and speeds up measurement, suitable for frequent high-voltage or DCDC measurements.

Voltage measurement modes include AC, DC, AC+DC (DM40B/C). Select any one to return to the measurement interface. Clicking MF also returns to the measurement interface. After returning to the main interface, the range mode is indicated in the top-left corner.

The side AUTO button implements AUTO or AUTO+ function according to the settings.

2.6.2 Resistance Measurement Settings

Taking DM40C resistance measurement setting as an example: Click the resistance Ω measurement button to enter resistance measurement mode, then click the MF button to enter the settings interface.

Explanation:

DM40C resistance measurement ranges include 6 manual ranges (600Ω/6KΩ/60KΩ/600KΩ/6MΩ/60MΩ) and one automatic range (AUTO). Select any one or click MF to return to the measurement interface. After returning to the main interface, the range mode is indicated in the top-left corner.

Resistance measurement include offline and online measurements. Offline mode is measuring the resistor separately after removing it, featuring high measurement voltage, fast speed, and high accuracy. Online mode is directly measure on the circuit board, featuring lower voltage, moderate speed, but small deviation. Select one or click MF to return to the measurement interface.

Click the resistance measurement button to quickly cycle through offline and online modes. Online mode is indicated by Ω with subscript ON.

3, Oscilloscope & Signal Generator Usage Instructions

Please refer to the document: DM40 Oscilloscope & Signal Generator Manual.pdf

4, Other Functions

4.1 System Settings

Access system settings by clicking Settings on the main interface.

Item	Content	Description
1.Language	Simplified、Traditional、English	Currently supports 3 languages
2. Power	Screen Dim Time :5min、10min、30min、Never Shutdown Time :10min、30min、1h、Never	Screen dims to minimum brightness Auto-shutdown at shutdown time
3.Startup page	Multimeter, Oscilloscope, Signal Generator, Main Interface	Quickly enter the set startup interface
4. Volume and Backlight	Backlight :10%~100% Volume :0%~100%	Minimum brightness :10% 0% turns off buzzer
5. Other Settings	USB Connection Factory Reset, Shockproof Mode Mode Remember	Firmware update and image upload Restores default settings Avoid error measurement DMM measure mode remember
6.Device info	Manufacturer, Website, Model, Serial Number, Software and Hardware Version	

Table 4.1 System settings

4.2 Firmware Update Instructions

System settings →Others, select USB connection, connect DM40 to a computer via USB cable. The computer will pop up a U-disk. Open the U-disk, place the latest firmware (dm40xxx.bin), eject the U-disk after transfer is complete. Then long-press the power button to restart and update the firmware automatically.

4.3 Custom Boot Logo

Create a boot logo with requirements: 480*320 resolution, 1-bit BMP image, named logo.bmp. Connect the device to a computer, open the U-disk, replace the existing logo.bmp file, and restart to apply. To remove the boot logo, delete the file directly.

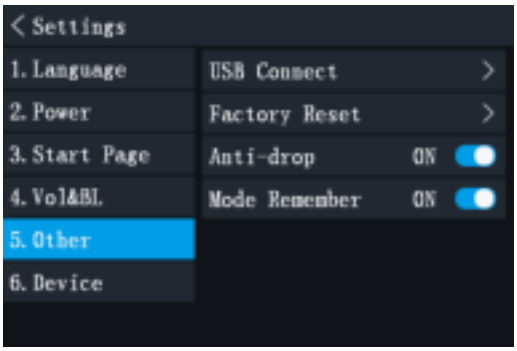
4.4 Quick screenshot instructions

Swipe down with 3 points and hear a beep~ prompt to start taking screenshots. The multimeter interface has anti aliasing effect and saves for a long time (4~5s). After completing the screenshot, it will prompt that the screenshot is successful (the saved image can be copied and viewed by connecting to a computer via USB).

4.4 Shockproof Mode Instructions

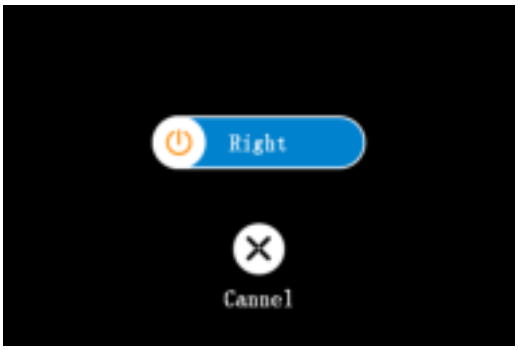
mV voltage measurement, resistance measurement, diode and continuity measurement, etc., require magnetic latching relays. Advantages of magnetic latching relays is low power consumption. The disadvantages are high cost, lack of drop resistance, and strong shaking that may cause erroneous measurements, especially for diode and on-off measurements.

Enabling shockproof mode keeps the relay engaged continuously, effectively avoiding false measurements caused by ordinary collisions. However, it increases power consumption, reducing endurance by about 1 hour. If the device is used in a fixed position without movement, it is recommended to disable shockproof mode for an average endurance of around 12 hours.



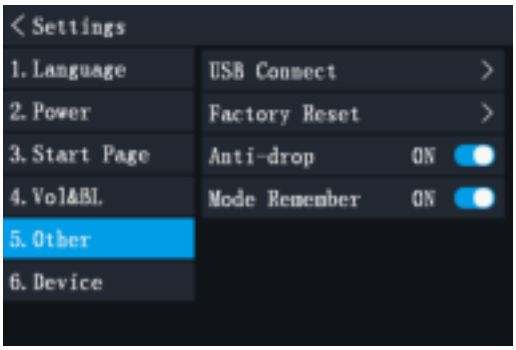
4.5 Slide to Shutdown and Auto-shutdown Instructions

Slide two fingers down to prompt slide to shutdown. Cancel or slide to the right to shut down. If no touch operations are performed within the auto-shutdown time, a 10s countdown with buzzer prompt will start. No operation will result in auto-shutdown.



4.6 Mode Memory Instructions

System setting→Others，enable mode memory function will remember the last measurement mode and automatically switch to it after restarting. Users can choose whether to enable this function based on actual needs.



5， Services

1. After – sales Service：

We warrant that the product will be free from defects in materials and workmanship for a period of 1 years from the date of purchase of the product by the original purchaser from our company. This warranty only applies to the original purchaser and is not transferable to a third party.

If the product proves defective during the warranty period, we will either repair the defective product without charge for parts and labour, or will provide a replacement in exchange for the defective product.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care.

2. Website

Download : www.alientek.com/download
Company : www.alientek.com
Aliexpress : www.aliexpress.com/store/1102909571

3. Contact US

E-mail : fae-smt@alientek.com