

ALIENTEK DM40C

ALIENTEK DM40C Digital Multimeter, Oscilloscope, and Signal Generator User Manual

Model: DM40C

1. INTRODUCTION

Thank you for choosing the ALIENTEK DM40C. This device is a professional 4.5-digit digital multimeter, oscilloscope, and signal generator integrated into a single handheld unit. It offers high precision measurements, a 50M sample rate oscilloscope, and various waveform generation capabilities, making it suitable for a wide range of electrical testing and diagnostic applications.

This manual provides essential information for the safe and effective operation, maintenance, and troubleshooting of your DM40C device. Please read it thoroughly before use.

2. SAFETY INFORMATION

Always observe safety precautions when using electrical testing equipment to prevent personal injury or damage to the device.

- **General Safety:** Ensure the device is in good working condition before use. Do not operate if damaged.
- **Voltage Measurement:** For DC-DC or high voltage measurements above 36V, it is recommended to use the **AUTO+** mode. This mode skips the millivolt (mV) range to prevent mismeasurement, sparking, and potential damage. The default AUTO mode includes the mV range, which may not be suitable for higher voltages.
- **MCX Connector Usage:** The MCX pin sizes for the alligator clip and oscilloscope probe differ. The alligator clip's inner pin is larger. **Do not attach the alligator clip to the CHA/CHB (oscilloscope analog channels)** The alligator clip is intended only for the OUT channel (waveform output) to avoid poor contact or damage to the oscilloscope's analog channels.
- **Current Measurement:** Ensure the circuit is de-energized before connecting the device for current measurements.
- **Fuses:** The unit is fused. If a fuse blows, replace it with one of the specified type and rating.
- **Test Leads:** Use only the provided or equivalent high-quality test leads. The included leads are fine-tipped, suitable for small electronics. For higher-current or heavier work, consider investing in more robust leads.

3. PRODUCT OVERVIEW

The ALIENTEK DM40C combines three essential tools into one compact device: a digital multimeter, an oscilloscope, and a signal generator. It features a high-resolution IPS touchscreen for clear data display and intuitive control.



Figure 3.1: The ALIENTEK DM40C unit shown with its standard accessories, including test leads, probe leads, and a USB-C cable.

ALIENTEK®

3 IN 1 Digital multimeter

4 5/6 High-precision | 60000 (MAX) count | Standard 5ppm REF

Oscilloscope 10bit ADC | 50M sampling rate | 10M bandwidth



Multimeter



Oscilloscope



Signal Generator



Figure 3.2: This image illustrates the core capabilities of the DM40C: a high-precision multimeter, a 10-bit ADC oscilloscope with 50M sampling rate, and a signal generator.

Key Features:

- **Multimeter:** 4.5-digit (59999 count) with high precision and 5ppm reference source.
- **Oscilloscope:** 10-bit ADC, 50MHz sampling rate, 10MHz bandwidth, 64kpts memory.
- **Signal Generator:** Generates various waveforms (Sine, Sawtooth, Triangular, Square).
- **Display:** 3.5-inch IPS touchscreen (480x320 resolution).
- **Power:** Rechargeable battery providing over 10 hours of operation.

Multi-touch IPS Screen

In-Plane Switching TFT, Rich colors and clear display

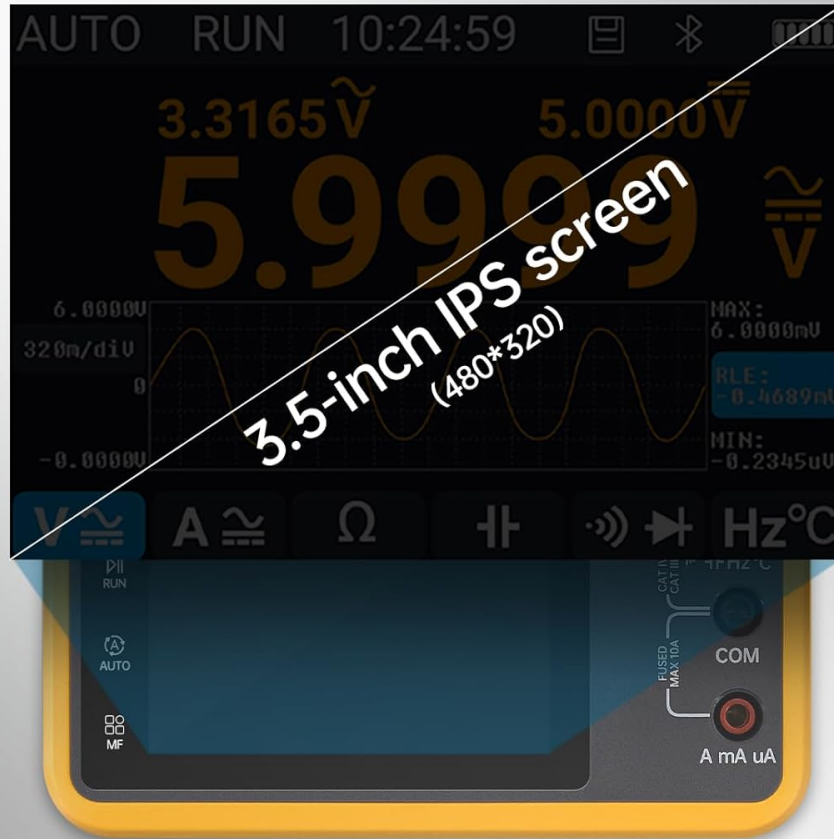


Figure 3.3: The device features a 3.5-inch IPS touchscreen (480x320 resolution) for clear display and intuitive interaction.

4. SETUP

4.1. Charging the Battery

The DM40C is powered by an internal rechargeable battery. Before first use, fully charge the device using the provided USB-C cable and a compatible USB power adapter (not included). The charging indicator on the device will show the charging status.

4.2. Connecting Test Leads

Connect the test leads to the appropriate input jacks on the right side of the device. The common (COM) jack is typically used for the black lead. The VΩHz°C jack is for voltage, resistance, frequency, and temperature measurements. The A mA uA jack is for current measurements. Ensure connections are secure.

4.3. Initial Power-On

Press and hold the power button to turn on the device. The IPS touchscreen will illuminate, displaying the main interface. Follow any on-screen prompts for initial setup or calibration if presented.

5. OPERATING INSTRUCTIONS

5.1. General Operation

- **Power On/Off:** Press and hold the power button.
- **Menu Navigation:** Use the touchscreen to navigate through menus and select functions.
- **Data Hold:** Freeze the current reading on the display.
- **Relative Measurement (RLE):** Measure the difference between a stored reference value and the current reading.
- **Data Logging:** Record measurement data over time.
- **Trend Graph:** Visualize measurement data trends graphically.

5.2. Multimeter Mode

The DM40C offers a comprehensive range of multimeter functions. Select the desired measurement mode from the main interface.

Basic Info				Model	DM40A	DM40B	DM40C	
Model	DM40A/B/C			Function	Range			Accuracy
Screen	Full Touch 3.5"IPS(480*320)			DC Voltage	400mV/4V/40V 400V/1000V	500mV/5V/50V 500V/1000V	600mV/6V/60V 600V/1000V	±(0.03%+5d)
Battery Life	≈12H(Multimeter)/10H(Oscilloscope)			AC Voltage	400mV/4V/40V 400V/750V	500mV/5V/50V 500V/750V	600mV/6V/60V 600V/750V	±(0.3%+15d)
Dimensions	140*83*25mm			DC Current	400uA/4000uA 40mA/400mA	500uA/5000uA 50mA/500mA	600uA/6000uA 60mA/600mA	±(0.15%+5d)
Weight	260g			AC Current	4A/10A	5A/10A	6A/10A	±(0.2%+5d)
Interface	USB/MCX/Banana Seat			AC Current	400uA/4000uA 40mA/400mA	500uA/5000uA 50mA/500mA	600uA/6000uA 60mA/600mA	±(0.5%+15d)
Oscilloscope /Signal Generator Technical Parameters								
Sample Rate	50MSa/S	Input Impedance	1MΩ	Resistor	400Ω/4KΩ/40KΩ 400KΩ/4MΩ 40MΩ	500Ω/5KΩ/50KΩ 500KΩ/5MΩ 50MΩ	600Ω/6KΩ/60KΩ 600KΩ/6MΩ 60MΩ	±(0.1%+5d)
Bandwidth	10Mhz	Timebase Mode	YT/ROLL	Capacitance	4nF/40nF/400nF 4uF/40uF	5nF/50nF/500nF 5uF/50uF	6nF/60nF/600nF 6uF/60uF	±(2.5%+30d)
Memory Depth	64Kpts	Sweep Mode	Auto/Normal/Single	Frequency	400uF/4mF 40mF	500uF/5mF 50mF	600uF/6mF 60mF	±(3.5%+30d)
Time Scale	100ns~50s	Trigger Type	Rising/Falling	Temperature	-40℃~1000℃(Standard probe temperature measurement range -20℃~300℃) -40℉~1832℉			±(1.0%+5℃) ±(1.5%+5℉)
Vertical Scale	10mV~10V/div (X1)	Persistence	OFF /Min/1S/∞	Continuity	0Ω~1KΩ			±(0.2%+5d)
Resolution	10bit	Math	FFT/ABS	Diode	0V~3.0V, 0Ω~1KΩ			±(1%+5d)
Coupling	AC/DC	Waveform	Square/Sine Triangle/Sawtooth					

Figure 5.1: The automatic measurement feature simplifies operation by automatically selecting the correct range for voltage (0.01mV-1000V DC, 0.01mV-750V AC) and current (0.01uA-10A) without manual mode switching.

- **Automatic Measurement:** The device can automatically detect and select the appropriate range for voltage (DC: 0.01mV-1000V, AC: 0.01mV-750V) and current (0.01uA-10A).
- **Voltage Measurement (AC/DC):** Connect leads to COM and VΩHz°C. Select AC or DC voltage mode.

Remember to use **AUTO+** for high voltage measurements (refer to Safety Information).

- **Current Measurement (AC/DC):** Connect leads to COM and A mA μ A. Ensure the circuit is open and the device is connected in series. The innovative 3-hole design allows fully automatic current measurement across μ A/mA/A ranges.
- **Resistance Measurement:** Connect leads to COM and V Ω Hz $^{\circ}$ C.
- **Capacitance Measurement:** Connect leads to COM and V Ω Hz $^{\circ}$ C.
- **Diode Test:** Connect leads to COM and V Ω Hz $^{\circ}$ C. The device provides a 4-stage voltage drop measurement with distinct audible indicators.

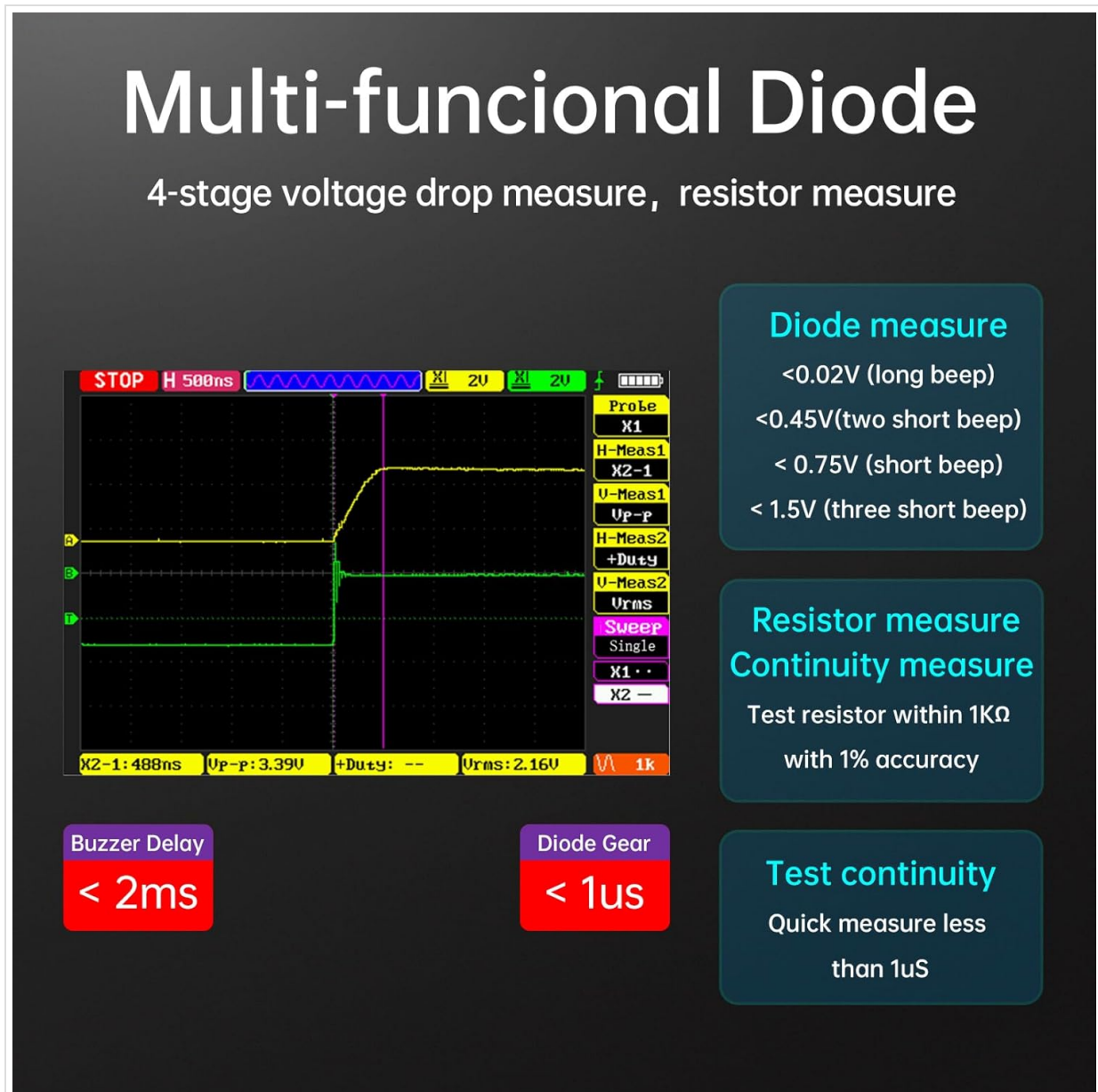


Figure 5.2: This screen capture details the diode measurement function with multiple voltage drop indications and the fast continuity test feature, including resistor measurement capabilities.

- **Continuity Test:** Connect leads to COM and V Ω Hz $^{\circ}$ C. An ultra-fast test with an audible indicator.
- **Frequency Measurement:** Connect leads to COM and V Ω Hz $^{\circ}$ C.
- **Temperature Measurement:** Requires a compatible temperature probe (not included). Connect the probe to the V Ω Hz $^{\circ}$ C and COM jacks.
- **AC+DC Mixed Measurement:** The DM40C supports simultaneous display of both AC and DC components for complex signals.

T-RMS/AC+DC/Trend Chart

T-RMS measure with higher accuracy

AC and DC measure simultaneous

(can effectively measure complex signals)

Trend chart displays measurement data periodically

3-speed adjustable time base(160mS/320mS/640mS)



Figure 5.3: The display demonstrates the device's ability to perform True RMS measurements, simultaneously display AC and DC components, and visualize data trends over time with adjustable time bases.

5.3. Oscilloscope Mode

The integrated oscilloscope provides waveform visualization and analysis. Connect the oscilloscope probe to the CHA/CHB input.

- **Basic Setup:** Select oscilloscope mode from the main menu. Adjust vertical scale (V/div) and horizontal time base (s/div) as needed.
- **Triggering:** Set trigger level and type (edge, pulse, etc.) to stabilize waveforms.
- **Measurements:** The oscilloscope can display various waveform parameters such as peak-to-peak voltage, frequency, and duty cycle.

5.4. Signal Generator Mode

The DM40C can generate various test signals. Connect the output to the OUT channel using the alligator clip (refer to Safety Information regarding MCX connector usage).

- **Waveform Selection:** Choose from Sine wave, Sawtooth wave, Triangular wave, or Square wave.
- **Frequency Adjustment:** Set the desired output frequency (1Hz to 50KHz for most waveforms, up to 10MHz

for square wave).

- **Amplitude Adjustment:** Adjust the peak-to-peak voltage (0.5Vpp to 3.0Vpp).
- **Duty Cycle:** Adjustable for Square wave (0-100%).

6. MAINTENANCE

6.1. Cleaning

Clean the device regularly with a soft, damp cloth. Do not use abrasive cleaners or solvents. Ensure the device is powered off and disconnected from any power source before cleaning.

6.2. Battery Care

To prolong battery life, avoid fully discharging the battery frequently. If storing the device for an extended period, charge it to approximately 50% and store in a cool, dry place.



Figure 6.1: The DM40C incorporates safety isolation for multimeter communication and is powered by a rechargeable battery providing over 10 hours of operation.

6.3. Firmware Updates

ALIENTEK may release firmware updates to add features or fix bugs. Check the official ALIENTEK website for the latest firmware and instructions on how to update your device. Exercise caution when installing third-party applications or firmware not directly from the manufacturer.

7. TROUBLESHOOTING

- **Device does not power on:** Ensure the battery is charged. Connect the USB-C cable and attempt to power on while charging.
- **Inaccurate readings:** Check test lead connections. Ensure the correct measurement mode is selected. Verify the battery level.
- **No oscilloscope waveform:** Check probe connection to CHA/CHB. Adjust vertical scale and time base. Verify trigger settings.
- **Sparkling during voltage measurement:** Immediately switch to **AUTO+** mode for high voltage measurements (above 36V) to prevent this. Refer to Safety Information.
- **Damage to oscilloscope input:** Ensure alligator clips are **not** connected to CHA/CHB. Alligator clips are for the OUT channel only. Refer to Safety Information.
- **Bluetooth connectivity issues:** Ensure your device has the latest firmware (version 2.2 or higher for Bluetooth functionality, if available for your model). Note that Bluetooth may only support multimeter functions.

8. SPECIFICATIONS

The following table outlines the key specifications for the ALIENTEK DM40C.

Special Features	DM40A	DM40B	DM40C	Signal generator waveform project parameters				
Maximum display(Range)	39999	49999	59999	Project	DM40A/B/C			
AUTO	✓	✓	✓	Output waveform	Sine wave	Sawtooth wave	Triangular wave	Square wave
TRMS	✓	✓	✓					
Frequency (Freq Response)	10KHz			Frequency	1Hz~50KHz			
AC+DC		✓	✓		100KHz~10MHz			
Duty cycle measure	5%~95%			Amplitude	0.5V~3.0Vpp			
Data hold(HOLD)	✓	✓	✓		3.0Vpp			
Relative measurement (RLE)	✓	✓	✓	Duty cycle	Not adjustable		0~100%	Not adjustable
Extreme value measurement (Max/Min)	✓	✓	✓					
Trend Chart(WAVE)	✓	✓	✓					

Figure 8.1: A comprehensive table outlining the technical specifications, measurement ranges, and accuracy for the DM40A, DM40B, and DM40C models across various functions including voltage, current, resistance, capacitance, frequency, and temperature.

ALIENTEK DM40C Key Specifications

Feature	Specification
Model	DM40C
Product Dimensions	5.5 x 3 x 1 inches
Weight	1.9 Pounds (approx. 260g)
Display	Full Touch 3.5" IPS (480x320)
Power Source	Battery Powered (1 9V battery included, rechargeable)
Battery Life	~12H (Multimeter) / ~10H (Oscilloscope)
DC Voltage Range	600mV/6V/60V/600V/1000V (Accuracy: $\pm(0.03\%+5d)$)
AC Voltage Range	600mV/6V/60V/600V/750V (Accuracy: $\pm(0.15\%+5d)$)
DC Current Range	600uA/6000uA/60mA/600mA/6A/10A (Accuracy: $\pm(0.2\%+5d)$)
AC Current Range	600uA/6000uA/60mA/600mA/6A/10A (Accuracy: $\pm(0.5\%+15d)$)
Resistance Range	600Ω/6KΩ/60KΩ/600KΩ/6MΩ/60MΩ (Accuracy: $\pm(0.1\%+5d)$)
Capacitance Range	6nF/60nF/600nF/6uF/60uF/600uF/6mF (Accuracy: $\pm(2.5\%+30d)$)
Frequency Range	10Hz - 60MHz (Accuracy: $\pm(0.01\%+5d)$)
Temperature Range	-40°C~1000°C (Standard probe temperature measurement range: 20°C~300°C) (Accuracy: $\pm(1.0\%+5^{\circ}\text{C})$)
Continuity Test	0Ω~1KΩ (Accuracy: $\pm(0.2\%+5d)$)
Diode Test	0V~3.0V, 0Ω~1KΩ (Accuracy: $\pm(1\%+5d)$)
Oscilloscope Sample Rate	50MSa/s
Oscilloscope Bandwidth	10MHz
Oscilloscope Memory Depth	64Kpts
Oscilloscope Resolution	10bit
Signal Generator Output Waveforms	Sine, Sawtooth, Triangular, Square
Signal Generator Frequency	1Hz~50KHz (Square wave up to 10MHz)
Signal Generator Amplitude	0.5V~3.0Vpp

9. WARRANTY AND SUPPORT

ALIENTEK products are designed for reliability and performance. For warranty information, please refer to the documentation included with your purchase or visit the official ALIENTEK website. For technical support, troubleshooting assistance, or inquiries about replacement parts, please contact ALIENTEK customer service through their official channels.


Related Documents - DM40C

	<p>ALIENTEK DM40 Multimeter User Manual: Features, Specifications, and Operation</p> <p>Comprehensive user manual for the ALIENTEK DM40 Touchable Multimeter 3-IN-1. Covers safety instructions, product introduction, quick start guide, measurement methods, technical specifications for multimeter, oscilloscope, and signal generator functions, system settings, firmware updates, and after-sales service.</p>
	<p>ALIENTEK DM40 Multimeter User Manual: Comprehensive Guide to Features and Operation</p> <p>Detailed user manual for the ALIENTEK DM40, a 3-in-1 digital multimeter, oscilloscope, and signal generator. Covers safety instructions, quick start guide, measurement methods, settings, system functions, and troubleshooting.</p>
	<p>ALIENTEK DM40 Multimeter User Manual: Features, Specifications, and Operation</p> <p>Comprehensive user manual for the ALIENTEK DM40 Touchable Multimeter 3-IN-1. Covers safety instructions, product introduction, quick start guide, measurement methods, technical specifications for multimeter, oscilloscope, and signal generator functions, system settings, firmware updates, and after-sales service.</p>
	<p>ALIENTEK DM40 Multimeter User Manual: Comprehensive Guide to Features and Operation</p> <p>Detailed user manual for the ALIENTEK DM40, a 3-in-1 digital multimeter, oscilloscope, and signal generator. Covers safety instructions, quick start guide, measurement methods, settings, system functions, and troubleshooting.</p>
	<p>ALIENTEK T80/T80P Smart Soldering Iron User Manual</p> <p>User manual for the ALIENTEK T80/T80P Smart Soldering Iron, a pocket-sized, multi-functional soldering iron with Type-C power, OLED display, and adjustable heating power.</p>

DP100 Digital Power User Manual

High Performance Digital Power

ALIENTEK




Product Name

Model

Version

Serial Number



ALIENTEK DP100 Digital Power User Manual

User manual for the ALIENTEK DP100 High Performance Digital Power Supply, covering safety instructions, product introduction, technical parameters, quick start guide, advanced functions, firmware and software updates, FAQ, and service information.

Documents - ALIENTEK – DM40C

DM40 Multimeter User Manual

Touchable Multimeter 3-IN-1

ALIENTEK



Product Name

Model

Version

Serial Number



Revision History		
Version	Date	Modify Contents
V1.0	20240101	First release
V1.1	20240101	Add firmware upgrade, connect host logs, quick start guide instructions
V1.2	20240101	Add multimeter measurement settings, connect host, add 60Vrms mode
V1.3	20240220	Add data record, multimeter mode settings, development mode, click to shutdown
V1.4	20250108	Add auto memory, quick search mode of memory, secondary shutdown
V1.5	20250108	Add Bluetooth function description and add connect host log registration

[ALIENTEK DM40 Multimeter User Manual: Comprehensive Guide to Features and Operation](#)

Detailed user manual for the ALIENTEK DM40, a 3-in-1 digital multimeter, oscilloscope, and signal generator. Covers safety instructions, quick start guide, measurement methods, settings, system functions, and troubleshooting.

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