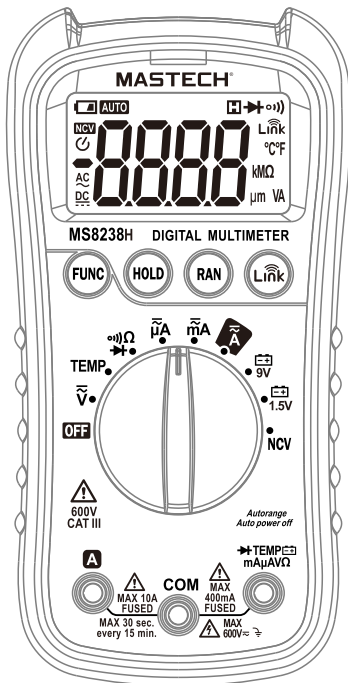


MASTECH[®]

MS8238H

Digital Multimeter User's Manual



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CONTENTS

1. Overview	01
2. Safety Information	01
2.1 Safety Standards	01
2.2 FCC Statement	02
2.3 Precautions	02
2.4 Electrical Symbols	04
3. Description	05
3.1 Front Panel	05
3.2 Display	06
3.3 Button Functions	07
3.4 Auto Power Off	07
4. Operating Instructions	08
4.1 AC/DC voltage	08
4.2 AC/DC current	08
4.3 Resistance	09

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CONTENTS

4.4 Continuity	09
4.5 Diode test	10
4.6 Battery test	10
4.7 Temperature	11
4.8 Non-Contact Voltage	11
4.9 Wireless Operation	11
5. Specifications	12
5.1 General Specifications	12
5.2 Technical Specifications	13
6. Maintenance	16
6.1 General Maintenance	16
6.2 Replacing the Battery	17
6.3 Replacing the Fuse	17
6.4 Replacing the Probe	18
7. Accessories	18

1. Overview

WARNING

To avoid electrical shock or personal injury, please read all safety information, warnings and precautions before using the meter.

The multimeter is a small, safe and reliable 3 ¼ digit handheld auto ranging multimeter. This meter can measure AC/DC voltage, AC/DC current, resistance, diode, continuity, battery test, temperature and non-contact voltage tests, along with Wireless communication capabilities. This tool is ideal for professionals and hobbyists alike.

2. Safety Information

2.1 Safety Standards

The multimeter meets the following safety standards:

EN/UL/CSA 61010-1, 61010-2-030, 61010-2-033 for electronic testing instruments. This meter meets CAT III 600V installations and a pollution degree of 2.

- The protection provided by the meter can only be ensured if all safety procedures are strictly followed.
- The safety symbols on the meter are to advise of potential dangerous situations. Caution is required when measuring close to the meter's safety limits.
- Never exceed the protection limit values indicated in the specifications for each range of measurement.

WARNING

The special attention should be paid when using the meter because the improper usage may cause electric shock and damage the meter. The safety measures in common safety regulations and operating instruction should be complied with when using. In order to make fully use of its functions and ensure safe operations please comply with the usage in this section carefully.

2.2 FCC Statement

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. 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.

Caution:

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

2.3 Precautions

To avoid electrical shock or personal injury, observe and follow all safety precautions

- Check the meter for damage before use. Do not use if any damage is observed.
- Check the test leads for cracks or exposed wires before using the meter. Replace if necessary.
- Ensure the meter works properly by testing a known voltage source first. If not working properly, the protective equipment may be damaged; have the meter serviced before using.

- Never measure voltages that may exceed the protection limit indicated on the meter.
- Always be careful when working with voltages above 60V DC or 30V AC rms. Keep fingers behind the probe barriers when making voltage measurements.
- Make sure the test leads are in the correct input jacks before measurement.
- Do not expose the meter to explosive gas, dust or vapor.
- When connecting the test leads to a measurement circuit, connect the common lead first, then the live lead. Reverse when disconnecting.
- Turn off power to circuit and discharge all capacitors before making resistance, continuity or diode measurements.
- In order to avoid incorrect DC voltage readings, check the circuit for AC voltage first, then put the meter in the appropriate DC voltage range.
- Turn off circuit power and check fuses before connect the leads when measuring current. Turn circuit power on after making connection.
- Never use the meter unless the back cover is in place and fastened securely.
- When the low battery indicator “” is displayed, replace the battery. The accuracy of the meter cannot be guaranteed while the low battery indicator is on.
- Before opening the case, always disconnect test leads from all energized circuits.
- For continued protection against fire, replace fuse only with the specified voltage and current ratings listed in the manual.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Measure known voltage with the meter to verify that the meter is working properly. If the meter is working abnormally, stop using it immediately. A protective device may be damaged. If there is any doubt, please have the meter inspected by a qualified technician.

2.4 Electrical Symbols

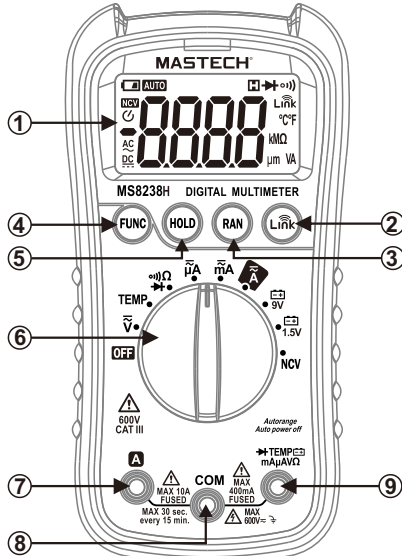
	Important safety information.
	High voltage with danger.
	Ground.
	Double Insulation (Class II safety equipment).
	Fuse must be replaced as per the specification herein.
	Accord with the related EU laws and regulations
	AC (Alternating Current)
	DC (Alternating Current)
	AC & DC (Both direct and Alternating Current)
	Conforms to UL STD. 61010-1, 61010-2-030 and 61010-2-033; Certified to CSA STD. C22.2, NO. 61010-1, 61010-2-030 and 61010-2-033

CAT III : MEASUREMENT CATEGORY III

is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.

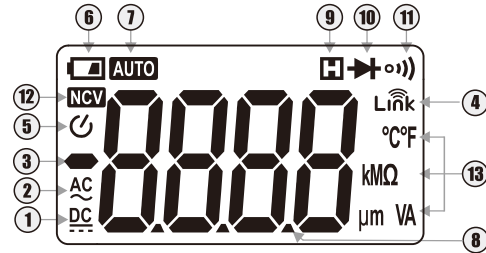
3 Description and Usage

3.1 Front Panel



- 1. LCD display
- 2. Wireless communication button
- 3. Range button
- 4. Function button
- 5. Data hold button
- 6. Rotary switch
- 7. 10A input jack
- 8. Common jack
- 9. Input jack (all functions except current greater than 400mA)

3.2 Display



1	DC	Direct Current/Voltage
2	AC	Alternating Current/Voltage
3		Negative Value
4	Link	Wireless Communication indicator
5		Auto Power Off
6		Low Battery
7	AUTO	Auto Range Active
8	0000	Main Display
9		Data Hold
10		Diode Test
11		Continuity Test
12	NCV	Non-contact Voltage
13	°C°F kΩ μm VA	Measurement Units

3.3 Button Functions

FUNC button:

- Press "**FUNC**" to switch between AC/DC or between function in a rotary switch position.

HOLD button:

- Press "**HOLD**" to keep the current reading on screen. "H" symbol will appear on the display.
- Press "**HOLD**" again to release the hold.

RAN button:

- Press "**RAN**" to switch to manual range. Each press of the button will switch to the next highest range, until reaching the highest range where it will switch to the lowest range.
- Hold "**RAN**" to return to auto range.

Link button:

- With the rotary switch in any position other than OFF, press **Link** to enable the Wireless communication function of the meter. Open the app (iOS or Android) on the mobile device to be used and search for the multimeter and establish a connection. Once connected, the app will mirror the display of the meter and show any measurement being performed. Press **Link** again to disconnect the meter from the mobile device.

3.4 Auto Power Off Function

- After 15 minutes of non-use the meter will automatically turn itself off.
- To turn the meter back on, press "**FUNC**".
- To deactivate the auto power off function, hold down "**FUNC**" when turning on the meter.  will no longer be displayed.

4. Operating Instructions

4.1 AC/DC voltage measurement

- Set the rotary switch to the AC/DC voltage position.
- Press "**FUNC**" to switch between AC and DC voltage.
- Connect the red test lead to the input jack and the black lead to the COM jack.
- Connect the leads to the circuit under test and read the measurement on the display. Observe polarity for DC measurements. In manual mode, If "OL" is display it means the measurement has exceeded the current range. Increase the selected range and measure again.

WARNING

Do not measure voltages higher than 600V DC or ACrms to prevent damage to the meter or personal injury

4.2 AC/DC current measurement

- Turn off power to the circuit. Allow all capacitors to discharge.
- Set the rotary switch to the appropriate AC/DC current range.
- Press "**FUNC**" to switch between AC and DC current.
- Depending on the current to be measured, connect the red test lead to either the input or 10A jack and the black lead to the COM jack.
- Break the circuit and connect the leads in series with the circuit (black lead on the lower voltage side).
- Turn circuit power on and read the measurement on the display. If "OL" is display, it means the measurement has exceeded the current range. Move the rotary switch to a higher range.

WARNING

Never measure open-circuit voltages exceeding 600V between the input terminals and ground to prevent injury or damage to the meter

NOTE

Check fuses before making current measurements. Make sure to use correct input jacks to prevent damage to the meter.

4.3 Resistance measurement

- Turn off power to the circuit. Allow all capacitors to discharge.
- Set the rotary switch to the multi-function position. The default function is resistance.
- Connect the red test lead to the input jack and the black lead to the COM jack.
- Connect the leads to the circuit under test and read the measurement on the display.

Tips for measuring resistance:

- In-circuit resistance is usually different from a resistor's rating due to the fact that the meter's test current flows in parallel with the circuit.
- For increased accuracy when measuring low resistances, short the test leads, record the value displayed, then connect the leads to the circuit and subtract the shorted value from the circuit measurement.
- When the leads are disconnected from the circuit under test, "OL" will be displayed on the screen.

WARNING

To prevent injury or damage to the meter, turn off power to circuit and discharge all capacitors fully before making resistance measurements.

4.4 Continuity measurement

- Turn off power to the circuit. Allow all capacitors to discharge.
- Set the rotary switch to the multi-function position. Press "FUNC" twice to enter continuity mode.
- Connect the red test lead to the input jack and the black lead to the COM jack.
- Connect the leads to the circuit under test. If the measured resistance is less than 50Ω, the buzzer will sound.

WARNING

To prevent injury or damage to the meter, turn off power to circuit and discharge all capacitors fully before making continuity measurements.

4.5 Diode test

- Turn off power to the circuit. Allow all capacitors to discharge.
- Set the rotary switch to the multi-function position. Press "FUNC" once to enter diode mode.
- Connect the red test lead to the input jack and the black lead to the COM jack.
- Connect the red test lead to the anode (+) and the black lead to the cathode (-) of the diode and read the measurement on the display. The meter will display "OL" if the connection is reversed.

WARNING

To prevent injury or damage to the meter, turn off power to circuit and discharge all capacitors fully before making diode measurements.

4.6 Battery test

- Set the rotary switch to the appropriate battery test range.
- Connect the red test lead to the input jack and the black lead to the COM jack.
- Connect the red test lead to the positive (+) end and the black lead to the negative (-) end of the battery and read the measurement on the display.

WARNING

To prevent injury or damage to the meter, do not connect the meter to a battery with a voltage rating exceeding 60V AC or 30V DC.

4.7 Temperature measurement

- Set the rotary switch to the temperature position. Press "FUNC" to switch between Celsius and Fahrenheit.
- Connect the positive end of the K-type thermocouple to the input jack and the negative end to the COM jack.
- Place the tip of the thermocouple to the surface of the object to be tested and read the measurement on the display.



WARNING

To avoid injury or damage to the meter, do not move the rotary switch to the temperature position while measuring voltages exceeding 30V.

4.8 Non-Contact Voltage (NCV) measurement

- Set the rotary switch to the NCV position.
- Move the top of the meter toward the voltage source. If voltage is detected (>100V AC), the meter will beep and the NCV indicator will flash. The closer to the voltage source the meter is, the faster the meter will beep/flash.

Note:

- Even without indication, voltage may still be present. Do not rely solely on NCV detection to determine the presence of voltage. Detection could be impaired by socket design, insulation thickness, or other factors.
- External interference sources could mistakenly trigger NCV indication.

4.9 Wireless Operation

- With the rotary switch in any position other than OFF, press **Link** to enable the **Wireless** communication function of the meter.
- Open the app (iOS or Android) on the mobile device to be used and search for the multimeter and establish a connection. Once connected, the app will mirror the display of the meter and show any measurement being performed.
- Press **Link** again to disconnect the meter from the mobile device.

5. Specifications

5.1 General Specifications

Function	Range
Safety Rating	CAT III 600V, pollution degree of 2
Operating Altitude	≤ 2000m
Operating Temperature/ Humidity	0~40°C, <80% RH
Storage Temperature/ Humidity	-10~60°C, <70% RH, remove battery
Temperature coefficient	0.1xaccuracy/°C (>18°C or <28°C)
Max. Input between terminals and earth ground	600V DC or AC T-RMS
Fuse Protection	µA/mA ranges: F 400mA H 600V 10A range: F 10A H 600V
Sample Rate	Approx. 3 times/sec.
Display	3½ digit LCD display
Overload Indication	Display shows "OL"
Low Battery Indication	When battery voltage drops below normal operating voltage, "  " is shown on the display
Polarity Indication	Display automatically displays "-"
Power Supply	DC 9V (NEDA 1604, 6F22 or 006P)
Wireless Communication Distance	Indoor/Outdoor: ≤ 10m
Supported App OS	iOS: 7.0 and above Android: 4.3 and above
Size(LxWxH)	Approx. 148x73.5x50mm
weight	Approx. 232g

5.2 Technical Specifications

Accuracy: $\pm$ (% of reading + digits) at 18°C~28°C with a relative humidity of <80%; guaranteed for a period of one year.

5.2.1 DC Voltage

Range	Resolution	Accuracy
400mV	0.1mV	$\pm$ (0.5% of reading +2 digits)
4V	0.001V	
40V	0.01V	
400V	0.1V	
600V	1V	$\pm$ (0.8% of reading +5 digits)

Input impedance: 10M Ω

Max. input voltage: 600V DC or AC T-RMS.

5.2.2 AC Voltage

Range	Resolution	Accuracy
400mV	0.1mV	$\pm$ (1.0% of reading +10 digits)
4V	0.001V	
40V	0.01V	
400V	0.1V	
600V	1V	

Input impedance: 10M Ω

Max. input voltage: 600V DC or AC T-RMS.

Frequency Response: 40~400Hz, T-RMS response

5.2.3 Resistance

Range	Resolution	Accuracy
400 Ω	0.1 Ω	$\pm$ (0.8% of reading +3digits)
4k Ω	0.001k Ω	
40k Ω	0.01k Ω	
400k Ω	0.1k Ω	
4M Ω	0.001M Ω	$\pm$ (1.2% of reading +3digits)
40M Ω	0.01M Ω	

5.2.4 Diode Test

Function	Range	Resolution	Description
Diode Test 	3V	1mV	Display shows forward voltage drop

5.2.5 Continuity

Function	Description	Description
	If measured resistance is less than 50 Ω , buzzer will sound	Open circuit voltage: ~1V

5.2.6 DC Current

Range	Resolution	Accuracy
400μA	0.1μA	±(1.0% of reading +10digits)
4000μA	1μA	
40mA	0.01mA	
400mA	0.1mA	
10A	10mA	±(2.0% of reading +8digits)

Overload protection: mA jack: F 400mA H 600V fuse
10A jack: F 10A H 600V fuse

Max input current: mA jack: 400mA DC or AC T-RMS
10A jack: 10A DC or AC T-RMS

When measuring current exceeding 2A, do not measure for longer than 2 minutes continuously. Wait 10 minutes to continue measurement.

5.2.7 AC Current

Range	Resolution	Accuracy
400μA	0.1μA	±(1.2% of reading +5digits)
4000μA	1μA	
40mA	0.01mA	
400mA	0.1mA	
10A	10mA	±(2.0% of reading +8digits)

Overload protection: mA jack: F 400mA H 600V fuse
10A jack: F 10A H 600V fuse

Frequency Response: 40~400Hz, T-RMS

Max input current: mA jack: 400mA DC or AC T-RMS
10A jack: 10A DC or AC T-RMS

When measuring current exceeding 2A, do not measure for longer than 2 minutes continuously. Wait 10 minutes to continue measurement.

5.2.8 Temperature

Range	Resolution	Accuracy
-20~1000°C	1°C	±(2.0% of reading +2 digits)
-4~1832°F	1°F	±(2.0% of reading +4 digits)

6. Maintenance

6.1 General Maintenance

This section provides basic information on maintaining the meter, such as replacing fuses and the battery. Only experienced and authorized personnel should make repairs to the meter.

WARNING

To avoid injury or damage to the meter, do not allow moisture inside the case and remove test leads before opening battery cover.

- Use a damp cloth to regularly clean the outside of the meter. Do not use abrasives or chemical solvents. Dirty or damp input jack can adversely affect readings.
- To clean input jacks, follow the following steps:
 1. Turn off the instrument and remove the test leads.
 2. Clear any dirt or other particles on the input jacks.
 3. Use a cotton ball/swab with a lubricant (i.e. WD-40) to clean off the contacts of the input jacks.
 4. Use a separate cotton ball/swab for each jack to prevent cross-contamination.

6.2 Replacing the Battery

WARNING

To avoid false readings and potential dangerous situations, replace the battery immediately when the “” symbol appears. Turn off the meter and disconnect the test leads before opening the battery cover to prevent electrical shock and personal injury.

Use the following steps to replace the battery:

1. Turn off the meter.
2. Remove test leads.
3. Unscrew and remove battery cover from back of meter.
4. Replace used battery with a new 9V battery.
5. Replace battery cover and fasten securely.

6.3 Replacing the Fuse

WARNING

Turn off the meter and disconnect test leads before opening back cover to avoid electrical shock and personal injury.

Use the following steps to replace the fuses:

1. Turn off the meter.
2. Remove test leads.
3. Remove outer holster.
4. Unscrew and remove back cover from the meter.
5. Replace blown fuse(s) with same amp/voltage ratings.
6. Replace back cover and fasten securely.
7. Replace outer holster.

6.4 Replacing the Probe

If insulation on probe is damaged, replace it.

WARNING

Use meet EN 61010-031 standard, rated CAT III 600V, 10A or better probe.

7. Accessories

1	Test Leads	1set
2	Package	1pcs
3	9V Battery	1pcs
4	User's Manual	1pcs
5	K type thermocouple	1pcs



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