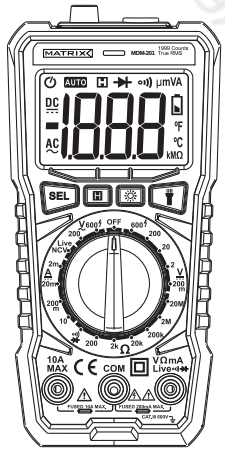
MATRIX Model: MDM-201

Digital Multimeter
Instruction Manual



MATRIX TECHNOLOGY INC.

Thank you for choosing **MATRIX**.

Before you use this product please read this manual carefully as it will familiarize you with the correct operating procedure for your MATRIX Digital Multimeter.

Summary

MDM-201is a miniature digital multimeter with 3½ digit display and manual range. The MDM-201has stable performance, high precision, high reliability, and overload protection function. Powered by 2xAAA 1.5V battery, this instrument features an LCD display with a large screen. It is easy to carry and a highly valued piece of equipment for users. The backlight can be programmed to turn off automatically after 30 seconds. The MDM-201of instruments can measure parameters including; AC/DC voltage, DC current, resistance, diodes, carry out on-off tests, zero-line judgement, non-contact voltage detection and the true effective value of AC. It is a tool with excellent performance; the ideal tool for laboratories, factories, radio enthusiasts and when carrying out home improvements.

Safety matters

This series of instruments are designed in accordance with IEC61010-1 (Safety Standard regulated by the International Electrotechnical Commission). Please read these safety precautions before using them.

1.Do not use to measure AC or DC voltages above 600V.
2.When measuring the voltages above 36V DC or 25V AC it is necessary to check whether the pen contacts the test point reliably, connects correctly, and insulates well, so as to avoid electric shock.
3.When changing function and range of the multimeter, remove the pen from the test point.
4.Read this manual to ensure you have chosen the correct range and operation for your test requirements to avoid injury or damage to the device. Although the MDM-201 features full range protection, please consider your safety at all times when operating with any voltage.

5.When measuring current, do not input current exceeding 10A.
6.Safety symbols illustration: " ⚠ " there is dangerous voltage, " ⏚ " electrical grounding, " ⧈ " double insulation, " ⚠ "The operator must refer to the instruction manual, " 🔋 " low device battery.

Troubleshooting

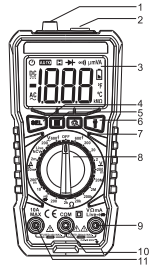
If your instrument does not work properly, the following methods can help you quickly solve general problems. If the problem is not rectified, please contact the maintenance center or dealer.

Failure phenomenon	Inspection position and method
No display	Battery polarity reversal
	Power is not connected
	Replace batteries
Low battery symbol display	Replace batteries
Current not input	Replace fuses
Large error of resistance display	Poor connection between test pen and circuit

Operation panel instructions

1.NCV Induction region
2.LED Light
3.LCD Display
4.SEL Function conversion key (press SEL to turn on and cancel / automatic shutdown)
5.HOLD data hold key
6. 🔦 Flashlight button (press this button to turn on the light, you can turn off the sound and light prompt later)
7.Backlight turn-on and turn-off key (automatic turn-off 30 seconds after backlight turn-on)
8.Functional range switch
9.Voltage/Resistor/Diode/On-off/Current/Firewire measurement input port

10.COM input port; negative input port, insert black pen
11.10A input port



Characteristic

1.General characteristics:

a.Display Mode: LCD display;
b.Display Range: 1999 (3½) digit automatic polarity display;
c.Measurement Method: double integral A/D conversion;
d.Sampling Rate: Approx. 3 times per second;
e.Overrange Display: the highest bit display "OL";
f.Low Voltage Display: " 🔋 " symbol appears;
g.Working Environment: (0-40) ℃, relative humidity less than 80%;
h.Power Supply: 2xAAA 1.5V batteries;
i.Volume (size): 148x70x42mm (length x width x height);
j.Weight: 200 g (including batteries);

2.Technical characteristics

Accuracy: (reading a%+the lowest effective digit) to ensure the accuracy of environmental temperature: (23±5)℃, relative humidity less than 75%. The calibration guarantee period is one year from the factory date.

3.Technical Indicators

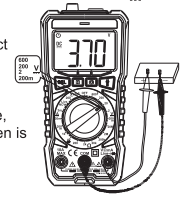
A.DC Voltage (DCV)

Range	Resolution	Accuracy
200mV	100μV	±0.5% reading±2digit
2V	1mV	±0.5% reading±2digit
20V	10mV	±0.5% reading±2digit
200V	100mV	±0.5% reading±2digit
600V	1V	±0.8% reading±2digit

Input Impedance:10 MΩ;
Overload protection: 600V DC or AC RMS.

The specific operation is as follows:

1.Insert the black pen into the 'COM' jack and the red pen into the 'VΩmA' jack.
2.Turn the range switch to the corresponding ' V ' range to display DC voltage measurement.
3.Use the test pen to contact the test point. The screen will display the measured DC voltage value. When measuring the DC voltage, the point where the red pen is connected is the positive polarity of the voltage.



Note:

a.Input voltage must not exceed DC600V or AC600V, if exceeded, there is a danger of damaging the instrument circuit.

b.When measuring high voltage circuits, special attention should be paid to avoiding electric shock.
c.After completing all measurement operations, disconnect the test pen from the circuit under test.

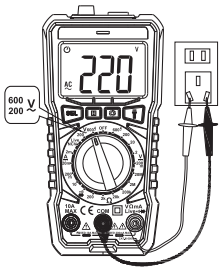
B.AC voltage (ACV)

Range	Resolution	Accuracy
200V	100mV	±1.2% reading±10digit
600V	1V	±1.2% reading±10digit

Input Impedance:10MΩ;
The frequency response of standard sinusoidal and triangular waves is 40Hz-1KHz; Frequency response of other waveforms is 40Hz-200Hz. Overload protection: 600V DC or AC RMS.

The specific operation is as follows:

1.Insert the black pen into the 'COM' jack and the red pen into the 'VΩmA' jack.
2.Turn the range switch to the corresponding ' V ' range to display AC voltage measurement.



Note:

a.There are some residual figures in each range before testing, but it does not affect the accuracy of measurement.
b.Input voltage must not exceed 600V RMS, if exceeded, there is a danger of damaging the instrument circuit.
c.When measuring high voltage circuits, special attention should be paid to avoiding electric shock.
d.After completing all measurement operations, disconnect the test pen from the circuit under test.

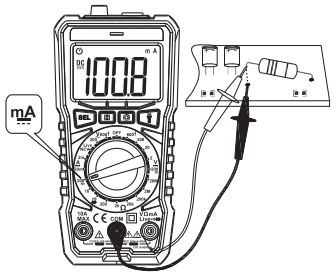
C.DC current (DC mA)

Range	Resolution	Accuracy
2mA	1μA	±1.0% reading±2digit
20mA	10μA	±1.0% reading±2digit
200mA	100μA	±2.0% reading±2digit

Maximum measured pressure drop is 200mV;
Overload protection: 200mA instant ceramic fuse.

The specific operation is as follows:

1.Insert the black pen into the 'COM' jack and the red pen into the 'VΩmA' jack.
2.Turn the range switch to the DC mA range, then connect the instrument in series to the return of the circuit to be tested. The measured current value and the current polarity of the red pen point will be displayed on the screen at the same time.



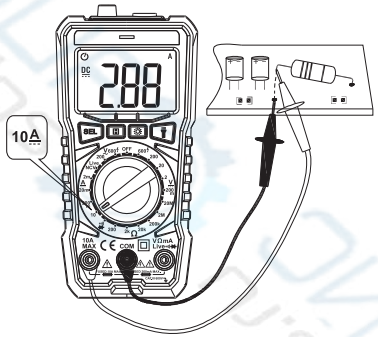
Note:

a.Turn off the power supply in the test circuit before the instrument is connected in series to the return circuit to be tested.
b.The maximum input current is 200 mA (depending on where the red pen is inserted), excessive current will damage the fuse of the device. Do not connect the test pen in parallel to any circuit when measuring current, it will damage the fuse and the instrument.
c.After completing all measurement operations, the power supply of the circuit under test should be switched off first, and then the connection between the test pen and the circuit under test should be disconnected, this is important when measuring large current.
d.Do not connect more than 36V DC or 25V AC voltage between current jack and 'COM' jack.

D.DC current 10A (DCA)

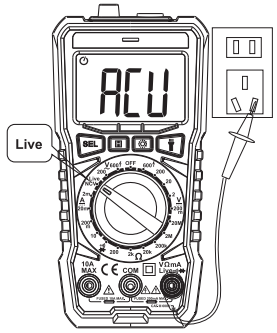
Range	Resolution	Accuracy
10A	10mA	±3.0% reading±2digit

Maximum measured voltage drop: 200 mV; Overload protection: 10A instant ceramic fuse.
The specific operation is as follows:
1.Insert the black pen into the 'COM' jack and the red pen into the '10A' jack.
2.Turn the range switch to the corresponding DC A position, then connect the instrument in series into the return circuit to be tested, and the measured current value and the current polarity of the red pen point will be displayed on the screen at the same time.



Note:
a.Turn off the power supply in the test circuit before the instrument is connected in series to the circuit to be tested.
b.The maximum input current is 10A (depending on where the red pen is inserted). Excessive current will damage the fuse of the device. Each measurement taken should not last more than 10 seconds; excessive current will make the circuit overheat and can damage the instrument.
c.When the test pen is inserted on the current input port, do not connect the needle of the test pen in parallel to any circuit, it will damage the fuse and instrument.
d.After completing all measurement operations, turn off the power supply of the test circuit before breaking the connection between the test pen and the circuit.
e.Do not connect more than 36V DC or 25V AC voltage between current jack and 'COM' jack.

E.Zero line/fire line measurement (Live)
The specific operation is as follows:
1.Turn the range switch to the 'Live/NCV' position (Screen displays 'ACV' in unmeasured state).
2.Insert the red pen into the 'VmA Live' jack (single pen insert is enough).
3.Insert the tip of the red pen into the zero line or the Fire Line. If using the Fire Line, the buzzer will emit a continuous sound while the panel indicator flashes and the screen displays '- - -', If using the Zero Line, the instrument emits a intermittent sound of while the panel indicator flashes and the screen displays '-'.
Note:
This function is suitable for 50Hz-1KHz frequency signal.



F.NCV measurement
The operation is as follows:
1.Turn the range switch to the 'NCV/Live' position (LCD displays ACV in the unmeasured state).
2.The top of the multimeter device features an NCV detector. Whenever the device is within range of AC voltage the instrument will emit an uninterrupted tone, depending on voltage. The LCD screen will display different segments on the NCV icon according to the strength of the signal.

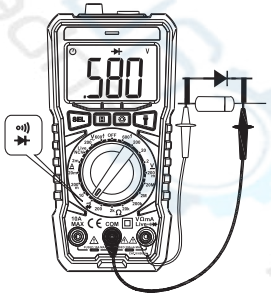
Note:
A.When measuring NCV non-contact voltage, please unplug the test pen to avoid electric shock.
B.Even if there is no indication, the voltage may still exist. Do not rely on non-contact voltage to determine whether there is a voltage in the conductor. Detection operation may be affected by factors such as insertion design, insulation thickness and other factors.
C.Disturbance from external environment (such as camera flash, motor, etc.) may cause NCV alarm by mistake.

G.Diode and on-off test

Rang	Display value	Test conditions
)))	The buzzer sounds continuously. The resistance of two points is less than (50+20)Ω	Open circuit voltage is about 2.1V, press SEL key to switch between two ranges.
▶|	Diode forward voltage drop	The forward DC current is 1mA and the open circuit voltage is about 2.2V.

Overload protection: 220V DC voltage or AC RMS.
Warning: Do not input voltage value in this range for safety!

Specific operations:
1.Insert the black pen into the 'COM' jack and the red pen into the 'VΩmA'jack (note that the red pen is +).
2.Turn the range switch to the '))) ▶| ' position and connect the pen in parallel to two points of the circuit under test. If the built-in buzzer sounds continuously and the on-off indicator lights up, the resistance between the two points is less than (50+20)Ω.
3.Press the SEL button, select the diode measurement, connect the pen to the diode to be measured, and the reading is the approximate value of the forward voltage drop of the diode, for the silicon PN junction. Generally about 500~800mV is confirmed to be the normal value. If the measured diode is Open-Circuit or polar reversal, it will show 'OL'.

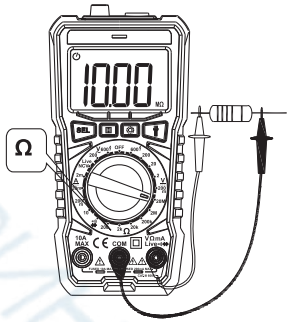


H.Resistance

Range	Resolution	Accuracy
200Ω	0.1Ω	±0.8% reading±3digit
2KΩ	1Ω	±0.8% reading±2digit
20KΩ	10Ω	±0.8% reading±2digit
200KΩ	100Ω	±0.8% reading±2digit
2MΩ	1kΩ	±0.8% reading±2digit
20MΩ	10kΩ	±1.0% reading±5digit

Open circuit voltage: less than 3V; Overload protection: 250V DC or 250V AC RMS.

Specific operations:
1.Insert the black pen into the 'COM' jack and the red pen into the 'VΩmA' jack.
2.Turn the range switch to the 'Ω'position, connect the pen in parallel to the measured resistance, and read the measurement results from the display.



Automatic shutdown-cancel automatic shutdown

The instrument will automatically power off and enter a dormant state after 15 minutes of inactivity. If you want to restart the device press any key to wake up the instrument. To deactivate automatic shutdown, when in the OFF position, press the SEL key and at the same time turn the range switch to any other position. The screen symbol ' ⏻ ' will disappear, and the buzzer will sound 3 times to indicate automatic shutdown has been cancelled. If you need shutdown function, shut down and while in the OFF position turn on the power again.

Special Statement

- Used batteries must be handled in accordance with local laws and regulations.
- TASI reserves the right to update and modify the product design specifications and instruction manual without prior notice

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