



MT873 Digital Multimeter

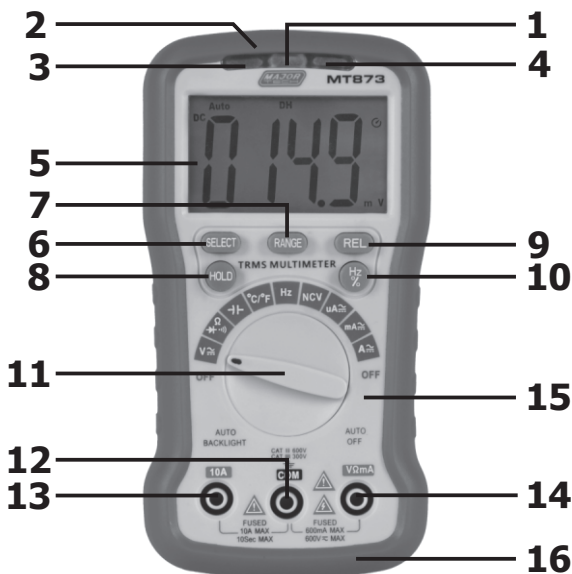
Introduction

The MT873 multimeter is a slim sized, portable, robust drop proof digital multimeter. The MT873 has a 6000 count digit LCD monitor with large 25mm digits that offer clear and easy reading. The circuitry design is centred on large-scale IC A/D converters in conjunction with an over-load protection circuit, the meters offers excellent performance and is ideal for a versatile digital multimeter.

The meters can be used to measure DC & AC voltage, DC & AC current, resistance, capacitor, frequency, duty cycle, temperature, Non Contact AC Voltage (NCV) detection, diode test and audible continuity. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

This Equipment 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.

Panel Layout



- CDS** sensor: The CDS sensor can reaction to the ambient brightness range, then automatically control the LCD backlight to lighten or go out.
- NCV detection area: Non Contact AC Voltage (NCV) detection area.
- NCV red light: Non Contact AC Voltage (NCV) detection red light.
- NCV green light: Non Contact AC Voltage (NCV) detection green light.
- LCD display: 6000 counts digit, full function symbol display.
- SELECT** key: This key work on the "→" range, press the key to choose resistance, diode or continuity test, on the voltage or current range, change to DC or AC, on the °C/°F range, change to °C or °F test; If press and hold SELECT key to power on, "Auto Power Off" function will be disabled.
- RANGE** Key: Press the "RANGE" key, the meter enters manual range mode, press it more than 2seconds again, return to auto mode.
- HOLD** key: Press the "HOLD" key to lock display value, and the "DH" sign will appear on the display, press it again to exit.
- REL** Key: Press the "REL" key, the meter enters relative measuring mode, "REL" is displayed on the LCD and the present reading becomes the reference value and displayed on the display. Relative measurement $REL\Delta = \text{measurement value} - \text{Reference value}$. Press it again to exit.
- Hz/%** Key: On "ACV/ACA" or "Hz" range, press the "Hz/%" key, you can choose the **Frequency** or **Duty Cycle** measurement.
- Rotary Switch**: Use this switch to select functions and ranges.
- COM**: COM and Temperature "—" Input Jack.
- 10A**: 10A Input Jack
- VΩmA**: V/μmA/Hz/Ω → → → and Temperature "+" Input Jack
- Meter casing
- Protective casing

Safety Information

- The meter is designed according to IEC-61010 concerning electronic measuring instruments with an over-voltage category 600V (CAT II) or 300V (CAT III) and pollution 2.
- Follow all safety and operating instructions to ensure that the meter is used safely and is kept in good operating condition.
- Safety symbols:



Important safety information, refer to the operating manual.



Dangerous voltage may be presence



Double insulation (protection Class II)

Special Cautions for Operation

- The meters can be safe only according to standard procedures when used in conjunction with the supplied test leads. Please replace damaged test leads with the same specifications.
- To avoid risk of electric shock, do not use the meter if the casing has been opened.
- The range switch should be in the right position before making a measurement.
- To avoid electric shock and damaging the instrument, the input signals must not exceed the specified limits.
- When measuring TV set or switched power, attention should be paid to the possible pulses that may cause damage to the circuitry.
- Range switch position must not be changed at random during measurement.
- Take caution against shock in the course of measuring voltage higher than DC 60V & AC 30V.
- Protection fuse should be replaced only with same type and same specification.
- After using the meter, set function switch to OFF to save battery power.
- If the meter is not used for a long time, take out battery to avoid damage by battery leakage.

General Specifications

- Max Voltage between input terminal and Earth: CAT II 600V or CAT III 300V
- Over-range Indication: display "OL" for the significant digit.
- Automatic display of negative polarity "-".
- Low Battery Indication: "E" displayed.
- Max LCD display: 6000 counts digit.
- Auto range & Manual range control
- Auto Power Off: When measurement exceeds 15 minutes without changing the mode and pressing key, the meter will switch to standby mode. Press any key to exit standby mode. When switching the meter back on, press and hold the **SELECT** key to disable auto power off.
- Auto LCD backlight
- Fuse protection: 600mA/600V Fast Fuse, 10A/600V Fast Fuse
- Power supply: 9V 6F22 battery
- Operating Temp.: 0°C to 40°C (relative humidity <85%)
- Storage Temp.: -10°C to 50°C (relative humidity <85%)
- Guaranteed precision Temp.: 23±5°C (relative humidity <70%)
- Dimension: 150 x 100 x 36mm
- Weight: approx. 250g (including battery)

Testing Specifications

Accuracy is specified for a period of year after calibration and at 18°C to 28°C (64°F to 82°F) with relative humidity to 70%.

DC Voltage

Range	Resolution	Accuracy
600mV	0.1mV	±(0.5% of rdg + 2 digits)
6V	1mV	
60V	10mV	
600V	100mV	±(0.8% of rdg + 2 digits)

* Impedance: 10MΩ, More than 100MΩ on 600mV range

* Overload protection: 600V DC or AC RMS

AC Voltage (True RMS)

Range	Resolution	Accuracy
6V	1mV	±(1.0% of rdg + 3 digits)
60V	10mV	
600V	100mV	±(1.5% of rdg + 3 digits)

* Impedance: 10MΩ

* Overload protection: 600V DC or AC RMS

* Frequency Range: 40 to 400Hz

DC Current

Range	Resolution	Accuracy
600μA	0.1μA	±(1.2% of rdg + 2 digits)
6000μA	1μA	
60mA	10μA	
600mA	100μA	
6A	1mA	±(2.0% of rdg + 3 digits)
10A	10mA	

* Overload protection: 600mA/600V Fast Fuse, 10A/600V Fast Fuse, 10A up to 10 seconds

AC Current (True RMS)

Range	Resolution	Accuracy
600μA	0.1μA	±(1.5% of rdg + 3 digits)
6000μA	1μA	
60mA	10μA	
600mA	100μA	
6A	1mA	±(2.5% of rdg + 5 digits)
10A	10mA	

Resistance

* Overload protection: 600mA/600V Fast Fuse, 10A/600V Fast Fuse, 10A up to 10 seconds

* Frequency Range: 40 to 400Hz

Range	Resolution	Accuracy
600Ω	0.1Ω	±(1.0% of rdg + 3 digits)
6kΩ	1Ω	
60kΩ	10Ω	±(1.0% of rdg + 2 digits)
600kΩ	100Ω	
6MΩ	1kΩ	
60MΩ	10kΩ	±(1.5% of rdg + 3 digits)

* Overload protection: 600V DC or AC RMS

Capacitance

Range	Accuracy	Resolution
9.999nF	±(3.0% of rdg + 10 digits)	1pF
99.99nF		10pF
999.9nF		100pF
9.999µF		1nF
99.99µF	±(5.0% of rdg + 10 digits)	10nF
999.9µF		100nF
9.999mF	±(10.0% of rdg + 20 digits)	1µF
99.99mF		10µF

* Overload protection: 600V DC or AC RMS

Frequency

Range	Accuracy	Resolution
9.999Hz	± (0.1% of rdg + 5 digits)	0.001Hz
99.99Hz		0.01Hz
999.9Hz		0.1Hz
9.999kHz		1Hz
99.99kHz		10Hz
999.9kHz		100Hz
9.999MHz		1kHz

* Sensitivity: sine wave 0.6V rms (9.999MHz: 1.5V RMS)

* Overload protection: 600V DC or AC RMS

Duty cycle

0.1%~99.9%: ± (2.0% of rdg + 2 digits), Frequency lower than 10kHz

* Sensitivity: sine wave 0.6V RMS

* Overload protection: 600V DC or AC RMS

Temperature

Range	Accuracy	Resolution	
°C	-20~150°C	± (3°C + 1digit)	1°C
	150~1000°C	± (3% of rdg + 2digits)	
°F	-4~302°F	± (5°F + 2digits)	1°F
	302~1832°F	± (3% of rdg + 3digits)	

* NiCr-NiSi Type-K sensor

* Overload protection: 600mA/600V Fast Fuse

Diode and Audible continuity test

Range	Description	Test Condition
	Display read approximately forward voltage of diode	Forward DC current approx. 1.5mA Reversed DC voltage approx. 4V
	Built-in buzzer sounds if resistance is less than 50Ω	Open circuit voltage approx. 2V

* Overload protection: 600V DC or AC RMS

Non Contact AC Voltage (NCV) detection

Test voltage range: 90V~1000V AC RMS

The NCV red light and green light will light up alternately together with sound

Operating Instructions

Attention before operation

- Check battery. When the battery voltage drops below proper operation range, the symbol will appear on the LCD display and the battery needs to be replaced.
- Pay attention to the besides the input jack which shows that the input voltage or current should be within the specified value.
- The range switch should be positioned to desired range for measurement before operation.

Measuring DC & AC Voltage

- Connect the black test lead to **COM** jack and the red to **VΩmA** jack.
- Set the rotary switch at the desired "**V**" range position, it shows symbol for testing DC voltage, if you want to test AC voltage, push "**SELECT**" button switch.
- Connect test leads across the source or load under measurement.
- You can get the voltage reading from LCD. The polarity of the red lead connection will be indicated along with the DC voltage value.

Note:

- means you can't input the voltage more than 600V, it's possible to show higher voltage, but it may damage the inner circuit or cause a shock.
- Be cautious against shock when measuring high Voltage.

Measuring DC & AC Current

- Connect the black test lead to **COM** jack and the red to the **VΩmA** jack for a maximum 600mA current , for a maximum 6A or 10A current, move the red lead to the 10A jack.
- Set the rotary switch at the desired "**uA**" & "**mA**" & "**A**" range position, it shows symbol for testing DC current, if you want to test AC current, push "**SELECT**" button switch.
- Connect test leads in series with the load under measurement.
- You can get the amperage reading from LCD. The polarity of the red lead connection will be indicated along with the DC current value.

Note:

- When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
- When only "OL" is displayed, it indicates over-range situation and the higher range has to be selected.
- means the socket mA's maximum current is 600mA and 10A's maximum current is 10A, over 600mA or 10A current can be protected by the fast fuse.
- On the 10A range, the measuring time should be less than 10 seconds to prevent precision from affecting by circuit heating.

Measuring Resistance

- Connect the black test lead to **COM** jack and the red to **VΩmA** jack.
- Set the rotary switch at the desired "**Ω**" range position.
- Connect test leads across the resistance under measurement.
- You can get the resistance reading from LCD.

Note: Max. input overload: 600V rms<10sec

- For measuring resistance above 1MΩ, the meter may take a few seconds to stabilize.
- When the input is not connected, i.e. at open circuit, the figure 'OL' will be displayed for the over-range condition.
- When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.

Measuring Capacitance

- Connect the black test lead to **COM** jack and the red to **VΩmA** jack.
- Set the rotary switch at the desired "**Ω**" range position.
- Connect test leads across the capacitance under measurement.
- You can get the capacitance reading from LCD.

Note: Max. input overload: 600V rms<10sec

- Capacitors should be discharged before being tested.
- When testing large capacitance, it will take longer time before the final value is measured (For 100uF~99.99mF range, it will take about 10 seconds).
- When testing small capacitance (≤1uF), to assure the measurement accuracy, first press "**REL**", then go on measuring.

Measuring Frequency & Duty cycle

- Connect the black test lead to **COM** jack and the red to **VΩmA** jack.
- Set the rotary switch at the desired "**Hz**" range position.
- Push "**Hz/%**" key to choose **Frequency** or **Duty** cycle test.
- Connect the probe across the source or load under measurement.
- You can get the frequency reading from LCD.

Measuring Temperature

- Connect the black banana plug of the sensor to **COM** jack and the red banana plug to the **VΩmA** jack.
- Set the rotary switch at the desired "°C/°F" range position, push "**SELECT**" to choose °C or °F or measurement.
- Put the sensor probe into the temperature field under measurement.
- You can get the temperature reading from LCD.

Note:

- The accessory of the meter type contact thermocouple limited temperature is 250°C, please use special probe for testing higher temperature.
- Please don't change the thermocouple at will, otherwise we can't guarantee to measure accuracy.
- Please don't measure voltage in the temperature function.

Diode & Audible continuity Testing

- Connect the black test lead to **COM** jack and the red to **VΩmA** jack.
- Set the rotary switch at the "**Ω**" range position, push "**SELECT**" to choose **Diode** or **Audible continuity** measurement.
- On **diode** range, connect the test leads across the diode under measurement, display shows the approx. forward bias voltage of this diode.
- On **Audible continuity** range, connect the test leads to two point of circuit, if the resistance is lower than approx. 50Ω, the buzzer sounds.

Note: Make sure the power is removed and all capacitors need to be discharged under this measurement.

Non-Contact AC Voltage detection

- Set the rotary switch at the desired "**NCV**" range position, the NCV green LED light will light up.
- Hold the Meter so that the meter's top is vertically and horizontally centred with the conductor, when the live voltage ≥ 90V AC rms, the NCV red LED light and green LED light will light up alternately together with sound.

Note:

- Even without LED indication, the voltage may still exist. Do not rely on non-contact voltage detector to determine the presence of voltage wire. Detection operation may be subject to socket design, insulation thickness and different type and other factors.
- When the meter measures voltage, due to the influence of presence of voltage, the voltage sensing indicator may also light up.
- Keep the meter away from electrical noise sources during the tests, i.e., fluorescent lights, dimmable lights, motors, etc.. These sources can trigger Non-Contact AC Voltage detection function and invalidate the test.

Battery replacement

- When the battery voltage drops below proper operation range the symbol will appear on the LCD display and the battery needs to be replaced.
- Before replacing the battery, set the selector switch to "**OFF**" position and remove the test leads from the terminals. Open the cover of the battery cabinet with a suitable screwdriver.
- Replace the old battery with the same type battery (9V 6F22).
- Close the cover of the battery cabinet and fasten the screw.

Fuse replacement

- This meter is provided with a 600mA/600V fast fuse to protect the battery test, temperature test and the current measuring circuits which measure up to 600mA, with a 10A/600V fuse to protect the 10A range.
- Ensure the meter is not connected to any external circuit, set the selector switch to "**OFF**" position and remove the test leads from the terminals. Open the cover of the battery cabinet with a suitable screwdriver.
- Replace the old fuse with the same type and rating: 6×32mm 600mA/600V fast fuse or 6×32mm 10A/600V fast fuse.
- Close the cover of the battery cabinet and fasten the screw.

Maintenance

- You must replace the test leads if the insulation is broken and the internal wire exposed. exposed, use the same test leads with the same specifications same specifications.
- Use only moist fabric or small amount of detergent but not chemical solution for cleaning.
- Do not use the meter before the back cover is properly closed and screw secured. Upon any sign of damage, stop operation immediately and send the meter for maintenance.
- Please take out the battery when not using for a long time.

Accessories

- Test Leads: electric rating 600V 10A. If the test leads need to be replaced, you must use a new one which should meet EN 61010-031 standard, rated CATIII 600V, 10A or better.
- "K" type thermocouple sensor probe
- Operator's Manual

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