



Item ref: 600.113UK

# **CMTS01**

## Smart Digital Multimeter

### User Manual



**Please read this manual thoroughly and ensure all contents are fully understood before using the apparatus.**



## Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the tester or to the equipment under test, adhere to these following rules:

- Before using the tester inspect the case. Do not use the tester if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity.
- Do not apply more than the rated voltage, as marked on the tester, between the terminals or between any terminal and grounding.
- When the tester is working at an effective voltage over 60V in DC or 30Vrms in AC, special care should be taken for there is danger of electric shock.
- Always use the proper terminals and function for your measurements.
- Do not use or store the tester in an environment of high temperature, humidity, explosive, flammable, damp or of a strong magnetic field. The performance of the tester may deteriorate after being exposed to any of these elements.
- When using the test leads, keep your fingers behind the finger guards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes.
- Replace the battery as soon as the low battery indicator  appears. With a low battery, the meter may produce false readings that can lead to electric shock and personal injury.
- Remove the connection between the testing leads and the circuit being tested and turn the meter power off before opening the meter case.

- The internal circuit of the meter shall not be altered at will to avoid damage of the meter and any accident.
- A soft cloth and mild detergent should be used to clean the surface of the tester on a regular basis. No abrasive and solvent should be used to prevent the surface of the tester from corrosion or damage.
- The tester is suitable for indoor use only.
- Turn the tester power off when it is not in use and take out the battery when not using for a long time. Check the battery regularly; replace the battery immediately if any signs of leaking appear. Battery acid will damage the tester.

### Electrical & LCD Symbols

 Safety warning	 High voltage warning
 Grounding Conductor	 Double insulation
 EU Safety Certification	 Battery low voltage
 Live line judgment	 AC signal
 DC signal	 AC & DC signal
 Auto range	 Electromagnetic field
 Non - contact voltage	 Continuous test
 Auto power off symbol	 Diode test
 Capacitance test	 Power switch

## General Specifications

Display: LCD, 6000 counts updates 2/sec

LCD Size: 35 x 25mm

Polarity Indication: "-" displayed automatically

Over-range Indication: "OL" displayed

Low Battery Indication: "  " displayed

Range select: auto or manual

Operation Temperature: 0°C to 40°C, less than 80%RH

Storage Temperature: -10°C to 50°C, less than 85%RH

Battery Type: 1.5V x 2, AAA size

Jaw Size: 30mm

Dimension(H×W×D): 187×65×24mm

Weight: Approx 50g with battery

## Technical Specifications

Accuracy is guaranteed for 1 year 23°C±5°C less than 80%RH

### DC Voltage

RANGE	RESOLUTION	ACCURACY
500mV	0.1mV	±(0.8% of rdg + 5 digits)
6V	1mV	±(0.8% of rdg + 3 digits)
60V	10mV	
600V	1V	±(1.0% of rdg + 5 digits)

**Note:** Voltages below 500mV cannot be accurately measured

Input Impedance: 10MΩ

Overload Protection: 600V DC or 600AC rms

Max. Input voltage: 600V DC

### AC Voltage (auto ranging)

RANGE	RESOLUTION	ACCURACY
500mV	0.1mV	±(1.2% of rdg + 8 digits)

6V	1mV	±(1.0% of rdg + 8 digits)
60V	10mV	
600V	1V	±(1.2% of rdg + 8 digits)

**Note:** Voltages below 500mV cannot be accurately measured.

Input Impedance: 10MΩ

Frequency Range: 40Hz~400Hz

Overload Protection: 600V DC or 600V AC rms

Response: Average, calibrated in rms of sine wave

Max. Input voltage: 600V AC rms

### AC Current

RANGE	RESOLUTION	ACCURACY
0.3A	10mA	±(2.0% of rdg + 10 digits)
2A	10mA	
20A	10mA	±(3.0% of rdg + 5 digits)
200A	100mA	
600A	1A	

Measuring voltage drop: 200mV

Frequency Range: 40 to 200Hz

**Note:** As the lowest calibration point is set to 10A, the accuracy measurement below 20A is only for reference, and the accuracy below 03A cannot be measured.

### Resistance (auto ranging)

RANGE	RESOLUTION	ACCURACY
60Ω	0.001Ω	±(1.5% of rdg + 5 digits)
60Ω	0.01Ω	
600Ω	0.1Ω	
6kΩ	1Ω	
60kΩ	100Ω	
6MΩ	1kΩ	

60M $\Omega$	10k $\Omega$	
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Open Circuit Voltage: about 0.25V  
 Overload Protection: 250V DC/AC rms

## Diode and Continuity

RANGE	INTRODUCTION	REMARK
	The approx. forward voltage drop will be displayed	Open circuit Voltage: about 3V
	The built-in buzzer will sound if the resistance is less than about 30 $\Omega$	Open circuit Voltage: about 3V

Overload protection: 250V DC/AC rms  
 For continuity test: When the resistance is between 30 $\Omega$  and 100 $\Omega$ , the buzzer may sound or may not sound. When the resistance is more than 100 $\Omega$ , the buzzer won't sound.

## Frequency

RANGE	ACCURACY
0~10KHz (clamp)	$\pm(1.5\%$ of rdg + 5 digits)

Overload Protection: 250V DC/AC rms

## Capacitance

RANGE	ACCURACY
6nF/60nF/600nF/6 $\mu$ F 60 $\mu$ F/60mF (15Sec)	$\pm(5.0\%$ of rdg + 8 digits)

Overload Protection: 250V DC/AC rms

## Operating Instructions

**Turning on and off meter:** Press and hold the power button  to turn on the meter, the meter will beep, and the LCD will display  $\text{Auto}$  symbol, indicating that the meter has entered the test state of automatically identifying the type of the measured signal. The AUTO symbol displayed on the top of the LCD means that the measured signal is in the auto range measurement mode.

### Automatic Identify Mode

Insert the black lead into the COM jack and the red lead into the INPUT jack. The meter can auto identify whether the measured signal is voltage or resistance. The red lead should be connected to the positive pole of the measured signal, otherwise the negative polarity symbol will appear. If the measured voltage signal is less than 500mV AC/DC, the meter cannot identify. If there is AC current flowing through the measured wire of the meter clamp, the meter will enter the state of auto current measurement, and the current measurement is the mode of auto range.

### Voltage & Resistance Measurement

When the meter identifies the signal as voltage, the meter can auto identify the AC or DC voltage signal. During measurement, the LCD directly displays the voltage reading, and the red lead indicates the polarity of the DC voltage signal. When the meter identifies the AC voltage signal, the LCD directly displays the reading of AC voltage and displays the symbol of AC voltage. When the meter identifies the signal as resistance, the LCD displays the reading of resistance. When the test resistance is less than  $50\Omega$ , the meter will emit a beep, indicating that the circuit under test is in short circuit state. When the measured voltage exceeds 600V, the meter will issue a warning sound, and the LCD displays the over range status OL.

### Current Measurement

During AC current measurement, ensure that the wire under test is in

working condition. Please open the trigger of the clamp head and clamp only one wire also try to make the wire perpendicular to the center of the clamp head to get a more accurate value. The reading on the display is the value of the AC current flowing through the conductor. **Note:** When more than two wires are clamped, the measurement will not be carried out normally. In general there are many wires in the cable, so the meter needs to find the separated wire to the terminal for measurement.

## Manual Selection of Functions

Press the SELECT button to enter the manual testing state, press this button successively, and the meter will enter the test state of NCV (non-contact voltage), capacitance and frequency. The LCD will display the corresponding function symbol identifier. Press this button again to enter the state of smart identification of test signal. **Note:** Resistance and voltage can only be tested in smart identification state.

## Manual Testing Tips

Under the above conditions, you need to carefully determine the type of input model, select the correct measurement function on the meter, and connect the lead to the object to be measured in parallel. The reading displayed on the meter is the reading of the input signal.

## Continuity Test

In manual function selection mode, the meter will beep when the test resistance is less than  $50\Omega$ , At the same time, the light on the meter will be continuously lit.

## Capacitance Measurement

Press the SELECT button repeatedly to choose the capacitance function and the LCD will display nF icon. Connect the black test lead to the "COM" jack and the red to the "INPUT" jack. Connect test leads across the capacitor to measure and be sure the polarity of the connection is observed.

**Note:** When the capacitance under measurement is above 100uF, the meter needs at least 10 seconds to display a stable reading.

## **NCV (Non-Contact-Voltage) Test**

In Auto mode press the SELECT button repeatedly to select NCV function, the LCD will display EF only. "NCV" means "non-contact voltage detection" without the use of test leads. Use the orange probe on top of the meter jaws to test the target. When an AC voltage of 30~1000V is detected, the meter will make a continuous sound, and the LCD will display the number of bars to indicate the voltage intensity.

## **Frequency Measurement**

In AUTO mode, press the SELECT button repeatedly to select the Frequency function and the LCD will display Hz only. Connect the black test lead to the "COM" jack and the red to the "INPUT" jack. Connect test leads to the signal carrier to be measured in parallel and the meter will then display the frequency.

## **Back Light and Hold Functions**

Press the  button for more than one second to enter the LCD screen backlight mode. Repeat the process to turn off the backlight function. A short press of the same button will hold the current reading on the LCD screen for recording etc. Only when you short press the button again can the meter be used for a new measurement function.

## **Auto Power Off (APO) Function**

The meter is fitted with an APO function to save battery wastage. This function will switch off the meter after around 15 minutes of inactivity.

## **Battery Replacement**

The  symbol on the display indicates the batteries are running low and

need replacing. Remove the small screw on the bottom of the battery cover and replace the 2 AAA batteries, ensuring you have the correct polarity for each battery. Replace the cover and screw to secure the unit.

## Accessories

- Remote cable test unit
- Set of test leads (red and black)
- 2pcs AAA batteries
- Instruction manual



This product is classed as Electrical or Electronic equipment and should not be disposed with other household or commercial waste at the end of its useful life. The goods must be disposed of according to your local council guidelines.

### Errors and omissions excepted.

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