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Multifunction Environment

Digital Multimeter

SPECIALIST

LIFETIME WARRANTY

- 4000 DISPLAY COUNT
- CAT IV 600V
- LIGHT & SOUND LEVELS
- RELATIVE HUMIDITY

Multifunction Environment

Digital Multimeter User Manual

Thank you for purchasing this Multifunction Environment Digital Multimeter. Use this multimeter to measure environmental conditions such as sound & light levels, indoor humidity and temperature. Ideal for use in server rooms, construction sites, factories, laboratories, greenhouse / hydroponics, archive & storage areas, and anywhere environmental conditions need to be considered. Take light readings of various spaces and compare them to the recommended levels listed in the enclosed manual. The multimeter also features non-contact voltage detection and measures both AC & DC voltage and current.

Please familiarise yourself with the functions of the multimeter before use. We recommend retaining this manual for ease of reference.

- Improper use of this meter can cause damage, shock, injury or death.
- Always remove the test leads before replacing the battery or fuses.
- Before using the meter, please inspect the condition of the test leads and the meter itself for any damage. If damage is present, please discontinue use.
- Do not measure voltage if the voltage on the terminals exceeds 1000V above earth ground.
- Use great care if voltages are greater than 30VAC RMS. Anything above this is considered a shock hazard.
- Always discharge capacitors and disconnect power before performing diode, resistance or continuity tests.
- Do not exceed the maximum limits of the input values shown in the specification tables on pages 12-16 of this manual.
- Remove the batteries from the meter if it will be unused for an extended period of time.
- Always turn the function switch to the off position when not in use.

FUNCTIONS	
Max. Display	4000 Count
Basic Accuracy	0.5%
DC Voltage Range	400mV - 250V
AC Voltage Range	400mV - 250V
DC Current Range	400µA - 10A
AC Current Range	400µA - 10A
Resistance	400Ω - 40MΩ
Capacitance (CAP)	50nF - 100µF
Frequency (Hz)	Up to 10MHz
Light Meter	Yes
Sound Meter	Yes
Relative Humidity	Yes

FUNCTIONS	
Temperature	Yes
Continuity	Yes
Non-Contact Voltage Detection	Yes
Data Hold	Yes
Relative Measurement	Yes
Diode Test	Yes
Duty Cycle	Yes
Autoranging	Yes
LCD Backlight	Yes
Auto Power Off	Yes

Photo Diode
Microphone
Humidity & Semiconductor Sensor
LCD Screen
LED Indicator
Relative Measurement Button
Hz% Button
Range Button
Hold & Backlight Button
Mode Button
Temperature Type Button
Function Switch
10A Input Jack
Positive VHz% Input Jack
Positive mA, µA Input Jack
COM Input Jack

The fuse & battery compartment are at the rear of the multimeter.

FUNCTIONS	
Autoranging/ Manual	The meter's default setting is autoranging. This automatically selects the best range for the selected test/measurement. • To set the meter to manual, press the RANGE button. The "AUTO" icon on the screen will turn off. • Press the RANGE button to move through the available ranges until you see the range you want. • To exit the manual mode and return to autoranging, press and hold the RANGE button for 2 seconds.
Mode	The MODE button helps you to move through various operations with various icons displayed on-screen. It also allows you to select between AC or DC current measurements.
Function Switch	Select a measurement range by turning the switch to the preferred option.
LCD Screen	Readings and measurements taken by the multimeter will display in this area.
Hold & Backlight	• Press the HOLD button to lock readings as displayed on the screen. Press again to unlock. • Press the HOLD button longer to turn the backlight on. Press the HOLD button longer again to turn the backlight off. Note: The backlight will automatically turn off after 10 seconds.
Relative Button	This allows you to make measurements relative to a stored reference value. The displayed value is then the difference between the referenced (stored) value and the measured value. • Press the REL button to store a reading. The REL indicator will appear on the display. The display will now indicate the difference between the stored value and the measured value. • Press the REL button to exit the relative mode.

Hz/% Button	• Press the button to measure frequency or duty cycle while measuring voltage. • Press the button again to return to measuring voltage.
°C/°F Room	Use this button to switch between Celsius and Fahrenheit room temperature measurements.
Non-Contact Voltage Detection	• Face the top of the multimeter to the ACV source you wish to test. • If source voltage is 50-1000V, the LED indicating light will turn on. NOTE: Static electricity or other sources of energy can randomly trip the sensor.
Input Jacks	• VHz%: Positive input terminal • COM: Negative input terminal • µA mA: Positive input terminal • 10A: Positive input terminal for 10A currents
Auto Power Off	The auto power off feature will turn the meter off after 30 minutes of inactivity.
Low Battery Indication	 will appear on screen when the battery voltage drops below the operating level.

SYMBOL	DESCRIPTION
	Continuity
	Diode Test
	Low Battery
AC	Alternating Current / Voltage
AUTO	Autoranging
DC	Direct Current / Voltage
HOLD	Display Hold
V	Volts
A, mA, µA	Current Range

SOUND LEVEL MEASUREMENT

1) Set the function switch to the "dB" position.
2) Remove the meter and face the microphone to sound source in a horizontal position.
3) The C-weighting curve is nearly uniform over the frequency range from 30 to 10,000Hz, thus giving an indication of overall Sound level.
4)The fast response is suitable to measure shout bursts and peak values from sound source.
5) The sound level will be displayed.

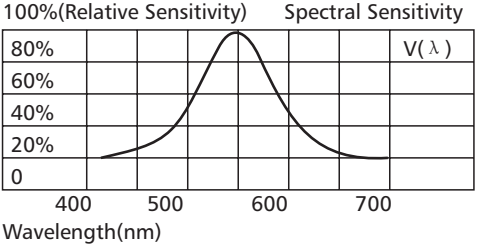
NOTE: Strong wind (over 10m/sec.) striking the microphone can cause misreading for measurement in windy locations, a windscreen should be used in front of microphone.

HUMIDITY MEASUREMENT

1) Set the function switch to the ON position.
2) Place the meter in the middle of the room you wish to measure.
3) Read the %RH in the display for about two hours.

LIGHT MEASUREMENT

1) Set the function switch to the desired "Lux" or "x10 Lux" range.
2) Remove the meter and face the photo detector to the light source in a horizontal position.
3) Read the illuminance nominal from the LCD display.
4) Over-range: If the instrument displays "1" in the M.S.D. the input signal is too strong, and a higher range should be selected.
5) When the measurement is completed, turn the function switch to the OFF position and remove it from the light source.
6) Spectral sensitivity characteristic: To the detector, the applied photo diode with filters makes the spectral sensitivity characteristic almost meet C.I.E (International Commission on Illumination) photopia curve V () as the following chart describes.



RECOMMENDED ILLUMINATION

LOCATIONS		LUX
Locations		Lux
Office	Conference, Reception room.	200 to 750
	Clerical work	700 to 1500
	Typing drafting	1000 to 2000
Factory	Packing work, Entrance passage	150 to 300
	Visual work at production line	300 to 750
	Inspection work	750 to 1500
	Electronic parts assembly line	1500 to 3000
Hotel	Public room, Cloakroom	100 to 200
	Reception, Cashier	200 to 1000
Store	Indoors stairs corridor	1500 to 3000
	Show window, Packing table	750 to 1500
	Forefront of show window	1500 to 3000
Hospital	Sickroom, Warehouse	100 to 200
	Medical Examination room, Operating room	300 to 750
	Emergency Treatment	750 to 1500
School	Auditorium, Indoor Gymnasium	100 to 300
	Class room	200 to 750
	Laboratory, library, drafting room	500 to 1500

OUTDOOR TEMPERATURE MEASUREMENT

1) Set the function switch to the °C or °F position.
2) Then the display will show the environment temperature reading value directly.
3) Insert the black plug of the temperature probe into the COM jack.
4) Insert the red plug into the "VHz%" jack.
5) Touch the end of the temperature sensor to the area or surface of the object to be measured. The display will show the temperature reading value directly.

AC & DC VOLTAGE MEASUREMENT

1) Insert the black test lead banana into the negative COM jack.
2) Insert the red test lead banana into the positive VHz% jack.
3) Set the function switch to the desired voltage measurement.
4) Connect the test leads across the source or load under measurement.
5) Press the MODE button to select AC or DC.
6) Note the reading displayed on the screen. The polarity of the red connection will be indicated when making a measurement.
7) Press the Hz% button to indicate "Hz" on the screen. Take note of the measured frequency.
9) Press the Hz% button again to indicate "%" on the screen. Take note of the measured % of duty cycle.

DC CURRENT MEASUREMENT

1) Insert the black test lead banana plug into the negative COM jack.
2) For current measurements up to:
- 4000μA DC - set the function switch to the μA position and insert the red test lead banana plug into the μA jack.
- 400mA DC - set the function switch to the mA position and insert the red test lead banana plug into the mA jack.
- 10A DC - set the function switch to the 10A position and insert the red test lead banana plug into the 10A jack.

3) Press the mode button until "DC" appears in the display.
4) Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
5) Touch the black test probe tip to the negative side of the circuit.
6) Touch the red test probe tip to the positive side of the circuit.
7) Apply power to the circuit.
8) Read the current in the display. The display will indicate the proper decimal point, value and symbol.

AC CURRENT MEASUREMENT

CAUTION: Do not make current measurements on the 10A scale for longer than 30 seconds. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

1) Insert the black test lead banana plug into the negative COM jack.
2) For current measurements up to:
- 4000µA AC - set the function switch to the µA position and insert the red test lead banana plug into the µA jack.
- 400mA AC - set the function switch to the mA range and insert the red test lead banana plug into the mA jack.
- 10A AC - set the function switch to the 10A position and insert the red test lead banana plug into the 10A jack.

3) Press the mode button until ''AC" appears on the display.
4) Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
5) Touch the black test probe tip to the negative side of the circuit.
6) Touch the red test probe tip to the positive side of the circuit.
7) Apply power to the circuit. Read the current in the display. The display will indicate the proper decimal point, value and symbol.

RESISTANCE MEASUREMENT

WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.

1) Set the function switch to the Ω position.
2) Insert the black test lead banana plug into the negative COM jack.
3) Insert the red test lead banana plug into the positive VHz% jack.
4) Press the mode button until Ω appears in the display.
5) Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
6) Read the resistance in the display. The display will indicate the proper decimal point, value and symbol.

CONTINUITY CHECK

WARNING: To avoid electric shock, never measure continuity on circuits or wires that have voltage on them.

1) Set the function switch to the Ω position.
2 Insert the black lead banana plug into the negative COM jack.
3) Insert the red test lead banana plug into the positive VHz% jack.
4) Press the MODE button until the symbol appears in the display.
5) Touch the test probe tips to the circuit or wire you wish to check.
6) If the resistance is less than approximately 50Ω, the audible signal will sound. If the circuit is open, the display will indicate OL.

DIODE TEST

1) Set the function switch to the Ω position.
2) Insert the black test lead banana plug into the negative COM jack.
3) Insert the red test lead banana plug into the positive VHz% jack.
4) Press the MODE button until the symbol appears in the display.
5) Touch the test probe tips to the diode you wish to test. Note the meter reading.
6) The diode can be evaluated as follows:
   A) A forward voltage will typically indicate 0.400 to 0.700V.
   B) Reverse voltage will indicate "OL".
   C) If both readings show OL, the device is open.
   D) If both readings are very small or 0, the device is shorted.

CAPACITANCE MEASUREMENTS

WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

1) Set the function switch to the CAP position.
2) Press the MODE button until "nF" appears in the display.
3) Insert the black test lead banana plug into the negative COM jack.
4) Insert the red test lead banana plug into the positive VHz% jack.
5) If the value displayed on the screen isn't zero then press the REL button.
6) Touch the test leads to the part to be tested.
7) Read the capacitance in the display. The display will indicate the proper decimal point, value and symbol.

FREQUENCY MEASUREMENT

1) Set the function switch to the Hz position.
2) Insert the black test lead banana plug into the negative COM jack.
3) Insert the red test lead banana plug into the positive VHz% jack.
4) Touch the test probe tips to the circuit under test.
5) Read the frequency in the display. The digital reading will indicate the proper decimal point, symbols (Hz, kHz, MHz) and value.

MEASUREMENT SPECIFICATIONS

The following guide is based on an environmental temperature of 18-28°C and humidity <70%.

SOUND LEVEL

Measurement Range:	35 to 100dB
Resolution:	0/1dB
Typical Instrument Frequency Range:	30Hz to 10kHz
Frequency Weighting:	C - weighting
Time Weighting:	Fast
Accuracy:	±5db at 94db sound level, 1kHz sine wace
Microphone:	Electric condenser microphone

5-2 LIGHT

Measurement Range:	4000, 40000 Lux (40000 Lux range reading x10)
Overrate Display:	Highest digit of "OL" is displayed
Accuracy:	±5% rdg +10 dgts (calibrated to standard incandescent lamp at color temperature 2856k)
Repeatability:	±2%
Temperature Characteristic:	±0.1%/°C
Photo Detector:	One silicon photo diode with filter

TEMPERATURE HUMIDITY

RANGE	RESOLUTION	ACCURACY
-4°F to 1382°F	1°F	3% od rdg ± 9dgts
-20°C to 750°C	1°C	3% od rdg ± 9dgts

Input Impedence 10MΩ
Overload Protection: 250VDC or 250VAC RMS

INDOOR TEMPERATURE RANGE

RANGE	RESOLUTION	ACCURACY
0°C to 50°C	0.1°C	3% od rdg ± 5dgts

INDOOR HUMIDITY RANGE

RANGE	RESOLUTION	ACCURACY
33%RH to 99%RH	1%RH	3% of rdg ± 5dgts

Input Impedence 10MΩ
Overload Protection: 250VDC or 250VAC RMS

DC VOLTAGE

RANGE	RESOLUTION	ACCURACY
400mV	0.1mV	±(1.0% reading + 4 digits)
4V	1mV	
40V	10mV	
400V	100mV	±(1.5% reading + 4 digits)
600V	1V	

Input Impedance: 10MΩ
Overload Protection: 600VDC RMS for 400mV range. 600VDC RMS for all other ranges.

AC VOLTAGE

RANGE	RESOLUTION	ACCURACY
400mV	0.1mV	±(1.5% reading + 15 digits)
4V	1mV	±(1.0% reading + 4 digits)
40V	10mV	
400V	100mV	±(1.5% reading + 4 digits)
600V	1V	±(2.0% reading + 4 digits)

Input Impedance: 10MΩ
Max. Input Voltage: 600VAC RMS
Frequency Range: 50~400Hz
Autoranging except for 400mV range

DC CURRENT

RANGE	RESOLUTION	ACCURACY
400μA	0.1μA	±(1.0% reading + 2 digits)
4000μA	1μA	± (1.0% reading + 2 digits)
400mA	100μA	± (1.2% reading + 2 digits)
10A	10mA	± (2.0% reading + 5 digits)

Overload Protection: 500mA/660V and 10A/600V fuse.
Maximum Inputs: 400mA DC RMS on μA/mA ranges, 10A DC RMS on 10A range. Autoranging for μA and mA ranges.

AC CURRENT

RANGE	RESOLUTION	ACCURACY
400µA	0.1µA	±(1.2% reading + 2 digits)
4000µA	1µA	
400mA	100µA	±(1.5% reading + 2 digits)
10A	10mA	±(2.0% reading + 5 digits)

Overload Protection: 500mA/660V and 10A/600V fuse.
Frequency Range: 50~400Hz.
Maximum Inputs: 400mA AC RMS on µA/mA ranges, 10A AC RMS on 10A range. Autoranging for µA and mA ranges.

RESISTANCE

RANGE	RESOLUTION	ACCURACY
400Ω	0.1Ω	±(1.5% reading + 4 digits)
4kΩ	1Ω	± (1.5% reading + 2 digits)
40kΩ	10Ω	
400kΩ	100Ω	
4MΩ	10kΩ	± (2.0% reading + 2 digits)
40MΩ	1MΩ	± (2.5% reading + 2 digits)

Overload Protection: 15 seconds maximum 250VDC or 250VAC RMS on all ranges. Max. Open Circuit Voltage: 2.8V

CAPACITANCE

RANGE	RESOLUTION	ACCURACY
50nF	10pF	±(5.0% reading + 7 digits)
500nF	0.1nF	±(3.0% reading + 5 digits)
5μF	1nF	
50μF	10nF	
100μF	0.1μF	±(4.0% reading + 5 digits)

Input Protection: 600VDC or 600VAC RMS

FREQUENCY

RANGE	RESOLUTION	ACCURACY
5Hz	0.001Hz	±(1.2% reading + 3 digits)
50kHz	0.01Hz	
500kHz	0.1Hz	
5kHz	1Hz	
50kHz	10Hz	
500kHz	100Hz	
10MHz	1kHz	±(1.5% reading + 4 digits)

Input Protection: 250VDC or 250VAC RMS.
Sensitivity: >0.5V RMS while ≤1MHz, >3V RMS while >1MHz.

MAINTENANCE

BATTERY INSTALLATION

To avoid the false readings, replace the battery as soon as the low battery power indicator appears. To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery cover. Do not operate the instrument with the battery cover removed.

1) Turn the power off and disconnect the test leads from the meter.
2) Open the rear battery cover with a screwdriver.
3) Remove the old battery and insert the new battery into the battery holder, observing the correct polarity.
4) Put the battery cover back in place, secure with the screws.

REPLACING FUSES

To avoid electric shock, disconnect the test leads from any source of voltage before removing the fuse cover. Do not operate the instrument with the fuse cover removed.

1) Turn power off and disconnect the test leads from the meter.
2) Remove the cover.
3) Gently remove the old fuse and install the new fuse into the holder.
4) Always use a fuse of the proper size and value (500mA/660V or 10A/600V fast blow).
5) Replace and secure the cover.

SPECIFICATIONS

Display:	4,000 count LCD display
Over Range Indication:	"OL" is displayed
Auto Power:	30 min (approx)
Polarity:	Automatic, minus (-) sign for negative
Measurement Rate:	3 times per second nominal
Low Battery Indication:	A battery icon displays if battery voltage drops below operating voltage
Battery:	1 x 9V
Operating Temperature:	0°C to 50°C
Storage Temperature:	-10°C to 60°C
Operating Humidity:	<70%
Storage Humidity:	<80%
Weight:	335g
Size:	170(L) x 78(W) x 48(H)mm

BOX CONTENTS

1 x Multimeter
1 x Test Leads
1 x K-Type Thermocouple
1 x 9V Battery
1 x Carry Case
1 x User Manual

WARRANTY

This product is protected by a lifetime warranty (from the date of purchase) covering all product manufacturing defects/faults that may occur within this timeframe. This warranty does not cover damage caused by neglect, misuse, contamination, alteration, accident or abnormal conditions of operation or handling, including failures caused by use outside of the product's specifications, or the normal wear and tear of mechanical components.

In the event that you suspect your product is defective/faulty, cease using the product when the suspected defect/fault arises and return the product along with proof of purchase to the place of purchase or distributor for assessment. Distributor contact details are available on the last page of this manual.

If the assessment concludes that the product is indeed defective/faulty, the product will either be repaired or replaced at no cost to you.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

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