INSTRUCTION MANUAL

MT1875

6-in-1 Environmental Multimeter

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1. Introduction

The 6-in-1 environmental multimeter has been designed to combine the functions of a Sound Level Meter, Light Meter, Humidity Meter, Temperature Meter, Non-Contact AC Voltage Tester and a Digital Multimeter.

The Sound Level function can be used to measure noise in factories, schools, offices, airports, home, etc., checking acoustics of studios, auditoriums and hi-fi installations. The Light Level function is used to measure illuminance in the field. It is fully cosine corrected for the angular incidence of light. The light sensitive component used in the meter is a stable, long life silicon diode.

The Temperature is for use as a semiconductor sensor and Type-K thermocouple. The digital multimeter performs AC/DC Voltage, AC/DC Current, Resistance measurement and Audible Continuity, Diode, Temperature test.

2. Safety Instructions

This meter has been designed for safe use, but must be operated with caution. The rules listed below must be carefully followed for safe operation.

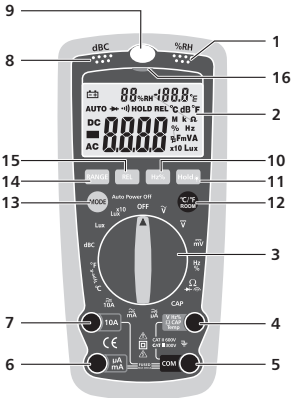
NEVER apply voltage or current to the meter that exceeds the specified maximum.

Input Protection Limits	
Function	Maximum Input
VDC or VAC	600V DC/AC RMS
mA AC/DC	500mA 660V fast acting fuse (500mA/660V)
A AC/DC	10A 600V fast acting fuse (10A for 30 seconds max every 15 minutes)
Frequency, Resistance, Capacitance, Duty Cycle, Diode Test, Continuity	600V DC/AC RMS
Temperature	600V DC/AC RMS

⚠ Indicates operators must refer to the explanation in this manual.

⚠ Indicates terminals at which dangerous voltage maybe present.

3. Panel Description



1. **Humidity & Temperature** - Humidity Sensor and Semiconductor sensor inside for indoor.
2. **LCD display** - 4000 count LCD display.
3. **Function switch**
4. **V / Hz% / Ω / CAP / °C input jack**
5. **COM input jack**
6. **µA / mA input jack**
7. **10A input jack**
8. **Microphone** - Electric condenser microphone inside.
9. **Photo Detector** - Long life silicon photo diode inside.
10. **Hz/% button** - The button at AC/DC Voltage measurement and AC/DC Current measurement and Hz% measurement Function is availability.
11. **Hold/Backlight button** - Press the HOLD button to "freeze" the reading on the display. The "HOLD" message will appear on the display. Hold the backlight button to turn the LCD light ON or OFF.

12. **Ambient Temp °C/°F** - Press the ambient temperature button to display temperature on screen in °C or °F
13. **MODE button** - To select AC or DC measurement when in A, mA, uA, and Ω, ⇥ ,◉ ranges.
14. **RANGE button** - To select AC or DC measurement when in Voltage, Ω ranges.
15. **REL button**

- The relative measurement feature allows you to make measurements relative to a stored reference value. A reference voltage, current, capacitor, etc. can be stored and measurements made in comparison to that value. The displayed value is the difference between the reference value and the measured value.
- Perform the measurement as described in the instructions.
- Press the REL button to store the reading in the display and 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.

16. **NCV indicate lamp**

4. Features

- 14 functions measure Sound level, Light, Humidity, Temperature, DC Voltage, AC Voltage, DC Current, AC Current, Resistance, Diode and Continuity test.
- 4000 count large LCD display with units of Lux, °C, %RH and dB indication.
- Easy to use with single function switch operating, compact and light weight.
- Sound level measures from 35dB to 100dB for C weighting checking with 0.1dB resolution.
- Light measuring levers ranging from 1 Lux to 40,000 Lux.
- Humidity measurement from 30%RH to 90%RH with 1%RH resolution and fast time response.

5. Specifications

5.1. General Specifications

Display:	4000 counts LCD display with function of Lux, °C, % and dB indication.
Polarity:	Automatic, (-) negative polarity indication.
Over-range:	"OL" mark indication.
Low battery indication:	The "🔋" is displayed when the battery voltage drops below the operating level.
Measurement rate:	3 times per second, nominal.
Operating environment:	0°C to 40°C (32°F to 104°F) at <70%RH
Storage temperature:	-10°C to 60°C (14°F to 140°F) at <80%RH
Battery:	9V
Dimensions:	170 x 78 x 48mm
Weight:	335g including holster

Accuracy is given at 18°C to 28°C (65°F to 83°F), less than 70%RH.

5.2. Sound Level

Measurement range:	35 to 100dB
Resolution:	0.1dB
Frequency Range:	30Hz to 10kHz
Frequency Weighting:	C – weighting
Time Weighting:	Fast
Accuracy:	±5dB at 94dB sound level, 1kHz sine wave.
Microphone:	Electric condenser microphone.

5.3. Light Level

Measurement range:	4000, 40,000Lux (40,000Lux range reading x 10)
Overrate Display:	Highest digit of "OL" is displayed.
Accuracy:	±(5% rdg +10 dgts) calibrated to standard incandescent lamp at colour temperature 2856k).
Repeatability:	±2%
Temperature Characteristic:	±0.1% / °C
Photo Detector:	One silicon photo diode with filter.

5.4. Temperature/Humidity

Function	Range	Resolution	Accuracy
Temperature Type-K	-20°C to 750°C	1°C	±(3% + 5 digits)
	-4°F to 1382°F	1°F	±(3% + 9 digits)

Input Impedance: 10MΩ
Overload Protection: 250V DC or AC RMS for 400mV ranges and 250V DC or 250V AC RMS for other ranges.

Function	Range	Resolution	Accuracy
Indoor Temperature	0°C to 50°C	0.1°C	±(3% + 5 digits)

Function	Range	Resolution	Accuracy
Indoor Humidity	33% to 99% RH	1%RH	±(3% + 5 digits)

Input Impedance: 10MΩ
Overload Protection: 250V DC or AC RMS for 400mV ranges and 250V DC or 250V AC RMS for other ranges.

5.5. Multimeter

Function	Range	Resolution	Accuracy
DC Voltage (Auto-Ranging)	400.0mV	0.1mV	±(1% + 4 digits)
	4.000V	1.0mV	
	40.00V	10mV	
	400.0V	100mV	±(1.5% + 4 digits)
	600V	1V	

Input Impedance: 10MΩ
Overload Protection: 600V DC or AC RMS for 400mV range and 600V DC or 600V AC RMS for other ranges.

Function	Range	Resolution	Accuracy
AC Voltage (Auto-Ranging Except 400mV)	400.0mV	0.1mV	±(1.5% ± 15 digits)
	4.000V	1.0mV	±(1% ± 4 digits)
	40.00V	10mV	
	400.0V	100mV	±(1.5% ± 4 digits)
	600V	1V	±(2% ± 4 digits)

Input Impedance: 10MΩ
Frequency Range: 50 to 400Hz
Maximum Input: 600V DC or 600V AC RMS

Function	Range	Resolution	Accuracy
DC Current (Auto-Ranging for uA and mA)	400.0uA	0.1uA	±(1% ± 2 digits)
	4000uA	1uA	±(1% ± 2 digits)
	400.0mA	100uA	±(1.2% ± 2 digits)
	10A	10mA	±(2% ± 5 digits)

Overload Protection: 500mA/660V and 10A/600V Fuse
Maximum Input: 400mA DC or 400mA AC RMS on uA/mA ranges, 10A DC or AC RMS on 10A range.

Function	Range	Resolution	Accuracy
AC Current (Auto-Ranging for uA and mA)	400.0uA	0.1uA	±(1.2% ± 2 digits)
	4000uA	1uA	±(1.2% ± 2 digits)
	400.0mA	100uA	±(1.5% ± 2 digits)
	10A	10mA	±(2% ± 5 digits)

Overload Protection: 500mA/660V and 10A/600V Fuse
AC Response: 50Hz to 400Hz
Maximum Input: 400mA DC or 400mA AC RMS on uA/mA ranges, 10A DC or AC RMS on 10A range.

Function	Range	Resolution	Accuracy
Resistance	400.0Ω	0.1Ω	±(1.5% ± 4 digits)
	4.000kΩ	1Ω	±(1.5% ± 2 digits)
	40.00kΩ	10Ω	
	400.0kΩ	100Ω	
	4.000MΩ	10kΩ	±(2% ± 2 digits)
	40.00MΩ	1MΩ	±(2.5% ± 2 digits)

Overload Protection: 15 seconds maximum 250V DC or 250V AC RMS, on all ranges.
Maximum Open Circuit Voltage: 2.8V

Function	Range	Resolution	Accuracy
Capacitance (Auto-ranging)	50.00nF	10pF	±(5% ± 7 digits)
	500.0nF	0.1nF	±(3% ± 5 digits)
	5.000uF	1nF	
	50.00uF	10nF	
	100.0uF	0.1uF	±(4% ± 5 digits)

Input Protection: 600V DC or 600V AC RMS

Function	Range	Resolution	Accuracy
Frequency (Auto-ranging)	5.000Hz	0.001Hz	±(1.2% ± 3 digits)
	50.00Hz	0.01Hz	
	500.0Hz	0.1Hz	
	5.000kHz	1Hz	
	50.00kHz	10Hz	
	500.0kHz	100Hz	
	10.00MHz	1kHz	±(1.5% ± 4 digits)

Sensitivity: >0.5V RMS while ≤1MHz,
Sensitivity: >3V RMS while >1MHz
Input Protection: 250V DC or 250V AC RMS

Function	Range
Diode Test	Test current 1.4mA DC and open circuit voltage 2.8V DC
Continuity	Built in Buzzer will be sound if the circuit resistance is less than 50Ω

Overload Protection: max 600V DC or 600V AC RMS

6. Operating Instructions

6.1. Measuring Sound Level

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

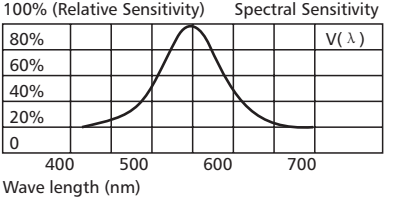
Note: Strong wind (over 10m/sec.) striking the microphone can cause misreading for measurement in windy locations, a windscreen should be used in front of microphone.

6.2. Measuring Humidity

- Humidity Measurement for indoor.
- Set the function switch to the ON position.
- Move the meter and place in the room.
- Read the %RH on the display after about two hours.

6.3. Measuring Light

- Set the function switch to the "Lux" scale and set the range to desired ("Lux" or "x10 Lux") range.
- Move the meter to face the photo detector to a light source in a horizontal position.
- Read the illuminance nominal from the LCD display.
- Over-range: If the instrument only display one "1" in the M.S.D. the input signal is too strong, and a higher range should be selected.
- When the measurement is completed. Remove the photo detector from the light source.
- 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 (λ) as the following chart described.



Recommended Illumination:

Locations	**Lux**
• Office	
Conference, Reception room	200 to 750
Clerical work	700 to 1,500
Typing drafting	1000 to 2,000
• Factory	
Packing work, Entrance passage	150 to 300
Visual work at production line	300 to 750
Inspection work	750 to 1,500
Electronic parts assembly line	1500 to 3,000
• Hotel	
Public room, Cloakroom	100 to 200
Reception, Cashier	200 to 1,000

- Store
  - Indoors Stairs Corridor 150 to 200
  - Show window, Packing table 750 to 1,500
  - Forefront of show window 1500 to 3,000
- Hospital
  - Sickroom, Warehouse 100 to 200
  - Medical Examination/Operating room 300 to 750
  - Emergency Treatment 750 to 1,500
- School
  - Auditorium, Indoor Gymnasium 100 to 300
  - Class room 200 to 750
  - Laboratory Library Drafting room 500 to 1,500

6.4. Measuring Temperature

Temperature Measurement for outdoor:

- Set the function switch to the °C position or °F position.
- Then the display will show the environment temperature reading value °C or °F respectively.
- Insert the black plug of temperature probe the COM jack and red plug to the "V / Hz% / Ω / CAP / °C jack".
- 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 °C or °F respectively.

6.5. Measuring DC Voltage

- Insert the black test lead banana to the COM jack and red test lead banana to the "V / Hz% / Ω / CAP / °C" jack.
- Set the function switch to the DCV ranges to be used and connect test leads connect test leads across the source or load under measurement.
- Set the function switch at DCmV ranges to be used connect test leads across the source or load under measurement.
- Read the LCD display. The polarity of the red connection will be indicated when making a DC measurement.
- Press the Hz% button to indicate "Hz".
- Read the frequency on the display.
- Press the Hz% button again to indicate "%".
- Read the % of duty cycle on the display.

6.6. Measuring AC Voltage

- Insert the black test lead banana to the COM jack and red test lead banana to the "V / Hz% / Ω / CAP / °C" jack.
- Set the function switch to the AC ranges to be used and connect test leads across the source or load under measurement.
- Read the LCD display. The polarity of the red connection will be indicated when making an AC measurement.
- Press the Hz% button to indicate "Hz".
- Read the frequency on the display.
- Press the Hz% button again to indicate "%".
- Read the % of duty cycle on the display.

6.7. Measuring DC Current

- Insert the black test lead banana plug into the negative COM jack. and the red test lead banana plug into the "uA/mA" or "10A" jack.
- For current measurements up to 4000uA DC, set the function switch to the μA position and insert the red test lead banana plug into the uA/mA jack.
- For current measurements up to 10A DC, set the function switch to the yellow 10A position and insert the red test lead banana plug into the 10A jack.
- Press the MODE button to indicate "DC" on the display.
- Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
- Touch the black test probe tip to the negative side of the circuit.
- Touch the red test probe tip to the positive side of the circuit.
- Apply power to the circuit.
- Read the current in the display.

6.8. Measuring AC Current

- Insert the black test lead banana plug into the negative COM jack. and the red test lead banana plug into the "uA/mA" or "10A" jack.
- For current measurements up to 4000uA AC, set the function switch to the uA position and insert the red test lead banana plug into the uA/mA jack.
- For current measurements up to 400mA AC, set the function switch to the mA position and insert the red test lead banana plug into the uA/mA jack.

- For current measurements up to 10A AC, set the function switch to the yellow10A position and insert the red test lead banana plug into the 10A jack.
- Press the MODE button to indicate "AC" on the display.
- Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
- Touch the black test probe tip to the neutral side of the circuit.
- Touch the red test probe tip to the "hot" side of the circuit.
- Apply power to the circuit.
- Read the current on the display.
- Press the Hz% button again to indicate "%".
- Read the % duty cycle on the display.
- Hold the Hz% button to return to current measurement.

6.9. Measuring Capacitance

- Set the function switch to the CAP position.
- Insert the black test lead banana plug into the negative COM jack.
- Insert the red test lead banana plug into the "V / Hz% / Ω / Cap / °C" jack. (If value is not zero in the display. Press the REL button to zero)
- Touch the test probe tips across the part under test.
- Read the capacitance value on the display.
- The display will indicate the proper decimal point and value.

6.10. Measuring Frequency

- Set the function switch to the HZ position.
- Insert the black test lead banana plug into the negative COM jack.
- Insert the red test lead banana plug into the "V / Hz% / Ω / Cap / °C" jack. (If value is not zero in the display. Press the REL button to zero)
- Touch the test probe tips across the part under test.
- Read the frequency value on the display.
- The display will indicate the proper decimal point, symbols (Hz, kHz, MHz) and value.

6.11. Measuring Resistance

- Set the function switch to the Ω ⊣⊢ •)) position.
- Insert the black test lead banana plug into the negative COM jack.

- Insert the red test lead banana plug into the "V / Hz% / Ω / CAP / °C" jack.
- Indicate "OL" "MΩ" on the display.
- 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.
- Read the resistance on the display.

6.12. Measuring Diode

- Set the function switch to the Ω ⊣ •)) position.
- Insert the black test lead banana plug into the negative COM jack.
- Insert the red test lead banana plug into the "V / Hz% / Ω / CAP / °C" jack.
- Press the MODE button to indicate "⊣" and "V" on the display.
- Touch the test probes to the diode under test. Forward voltage will typically indicate 0.400 to 0.700V. Reverse voltage will indicate "OL". Shorted devices will indicate near 0V and an open device will indicate "OL" in both polarities.

6.13. Audible Continuity Test

- Set the function switch to the Ω ⊣ •)) position.
- Insert the black test lead banana plug into the negative COM jack.
- Insert the red test lead banana plug into the "V / Hz% / Ω / CAP / °C" jack.
- Press the MODE button to indicate"⊣" and "Ω" on the display.
- Touch the test probe tips to the circuit or wire you wish to check.
- If the resistance is less than approximately 50Ω, the audible signal will sound. If the circuit is open, the display will indicate "OL".

6. 14. Non-Contact AC Voltage Test (NCV)

- Set the function switch to the HZ position.
- Move the meter and the face of the NCV detector to an ACV source.
- If source voltage is between 50-1000V the NCV indicate lamp will light.

7. Maintenance

Battery and Fuse Replacement

If the sign "  " appears on the LCD display, it indicates that the battery should be replaced. Remove screws on the back cover and open the case. Replace the exhausted battery with new batteries.

Fuses rarely need replacement and blow almost always as a result of the operator's error. Open the case and replace the blown fuse with ratings specified.

⚠ Warning:

Before attempting to open the case, be sure that test leads have been disconnected from measurement circuits to avoid electric shock hazard.
Replace fuse only with specified ratings:
Fuse1: F10A / 600V fast blow.
Fuse2: F500mA / 660V fast blow.

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