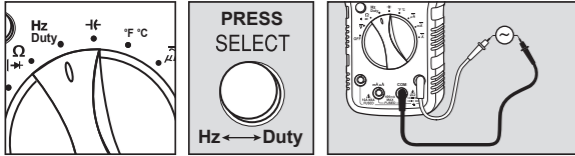


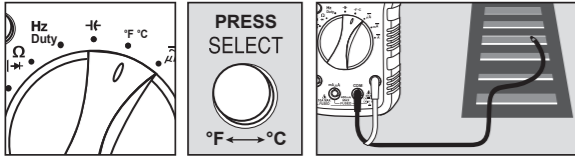
6. Frequency (Hz) /Duty Cycle < 1MHz

Features: **HOLD**



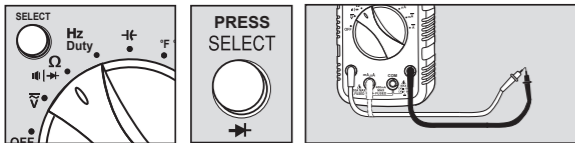
7. Temperature

Features: **HOLD** **MAX/MIN** **REL**



- **Do not** apply voltage to thermocouple.
- Fahrenheit range: -58° to 1832°F
- Celsius range: -50° to 1000°C

Testing Fuses



- "O.L." indicates blown fuse.

SYMBOLS USED ON LCD

~	AC Measurement	—	DC Measurement
-	Negative DC Value	<b>AT</b>	Auto Range Active
<b>O.L.</b>	Overload: Range Exceeded	<b>Apo</b>	Auto Power-Off Active
<b>+</b> <b>-</b>	Low Battery	<b>HOLD</b>	Hold Active
<b>MIN</b>	Minimum Reading	<b>MAX</b>	Maximum Reading
%	Duty Cycle Mode	Hz	Frequency Mode
<b>V</b>	Voltage Measurement	<b>A</b>	Current in Amps
<b>Ω</b>	Resistance in Ohms	<b>▲</b>	Relative Reading
<b>F</b>	Capacitance in Farads	<b>▶</b>	Diode Test
°F	Degrees Fahrenheit	<b>   </b>	Continuity Test
<b>n</b>	Nano 10 <sup>-9</sup>	°C	Degrees Celsius
<b>m</b>	Milli 10 <sup>-3</sup>	<b>μ</b>	Micro 10 <sup>-6</sup>
<b>M</b>	Mega 10 <sup>6</sup>	<b>k</b>	Kilo 10 <sup>3</sup>

ELECTRICAL SPECIFICATIONS

DC Voltage Measurement

Range	Resolution	Accuracy
400mV - 400V	0.1mV - 0.1V	± (0.5% + 4 digits)
1000V	1V	± (0.8% + 10 digits)

Overload Protection: 1000 V Input Impedance (Nominal): > 10 MΩ, < 100 pF

AC Voltage Measurement

Range	Resolution	Accuracy
400mV - 400V	0.1mV - 0.1V	± (0.75% + 5 digits) 40Hz - 400Hz
1000V	1V	± (1.0% + 8 digits) 40Hz - 400Hz

Overload Protection: 1000V RMS Input Impedance (Nominal): > 10MΩ, < 100pF  
Response: Averaging

DC Current Measurement

Range	Resolution	Accuracy
400μA - 400mA	0.1μA - 0.1mA	± (1.0% + 5 digits)
4A - 10A	1mA - 10mA	± (1.5% + 5 digits)

Overload Protection:  
• **μAmA Input:** 400mA (F 440mA/1000V fuse)  
• **A Input:** 10A (F 11A/1000V fuse)

AC Current Measurement

Range	Resolution	Accuracy
400μA - 400mA	0.1μA - 0.1mA	± (1.5% + 5 digits)
4A - 10A	1mA - 10mA	± (2.0% + 5 digits)

Overload Protection:  
• **μAmA Input:** 400mA (F 440mA/1000V fuse)  
• **A Input:** 10A (F 11A/1000V fuse)

Frequency: 40Hz to 400Hz  
Response: Averaging

Resistance Measurement

Range	Resolution	Accuracy
400Ω - 4MΩ	0.1Ω - 0.001MΩ	± (1.0% + 5 digits)
40MΩ	0.01MΩ	± (1.5% + 10 digits)

Overload Protection: 600V RMS

Capacitance Measurement

Range	Resolution	Accuracy
40nF	0.01nF	± (3.5% + 6 digits)
400nF - 4000μF	0.1nF - 1μF	

Overload Protection (Voltage): 600V RMS

Frequency Measurement

Range	Resolution	Accuracy
9.999Hz - 999.9kHz	0.001Hz - 0.1kHz	± (0.1% + 3 digits)

Overload Protection: 600V RMS Sensitivity: 0.7V RMS

Duty Cycle Measurement

Range	Resolution	Accuracy
0.1 - 99.9%	0.1%	± (0.2% per kHz + 0.1% + 5 digits)

Overload Protection: 600V RMS  
Frequency Range: 0.5Hz to 100kHz, pulsewidth > 2μsec

Temperature Measurement

Range	Resolution	Accuracy
-58 - 1832°F	0.1 - 1°F	± (3.0% + 5.4°F)
-50 - 1000°C	0.1 - 1°C	± (3.0% + 3.0°C)

Overload Protection: 600V RMS  
Thermocouple Accuracy: Not specified

Diode Test

Overload Protection	Test Current (Typical)	Open Circuit Voltage	Range
600V RMS	0.25mA	< 1.6V DC	2.0V DC

Continuity Test

Overload Protection	Open Circuit Voltage
600V RMS	Appx. 0.44V

WARRANTY

[www.kleintools.com/warranty](http://www.kleintools.com/warranty)

CLEANING

Turn instrument off and disconnect test leads. Clean the instrument by using a damp cloth. Do not use abrasive cleaners or solvents.

STORAGE

Remove the batteries when instrument is not in use for a prolonged period of time. Do not expose to high temperatures or humidity. After a period of storage in extreme conditions exceeding the limits mentioned in the Specifications section, allow the instrument to return to normal operating conditions before using it.

DISPOSAL / RECYCLE



**Caution:** This symbol indicates that equipment and its accessories shall be subject to a separate collection and correct disposal.

CUSTOMER SERVICE

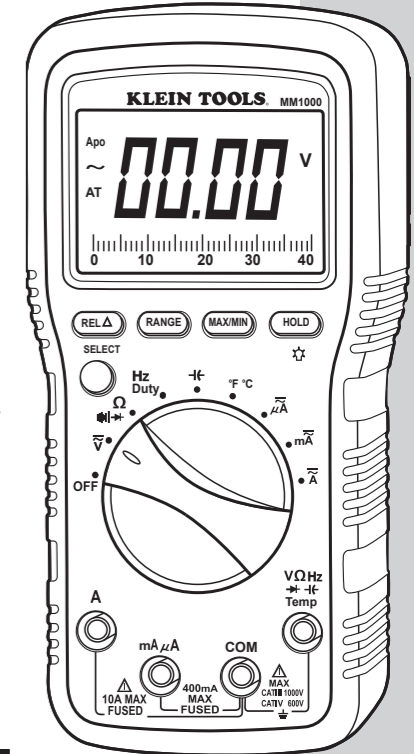
**KLEIN TOOLS, INC.**  
450 Bond Street  
Lincolnshire, IL 60069  
[www.kleintools.com](http://www.kleintools.com)



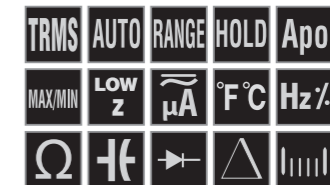
Instruction Manual

ENGLISH

- **AUTO / MANUAL RANGE**
- **MAX / MIN**
- **BAR GRAPH**
- **DATA HOLD**
- **3-3/4 DIGIT 3999 COUNT LCD**
- **BACKLIGHT**
- **LEAD HOLDER**



1000V ≈  
10A ≈



**KLEIN TOOLS**  
EST. 1857  
For Professionals... Since 1857<sup>®</sup> USA



Intertek  
3194551

# MM1000

## Instruction Manual

### GENERAL SPECIFICATIONS

The Klein Tools MM1000 is an auto-ranging multimeter. It measures AC/DC voltage, AC/DC current, resistance, capacitance, frequency, duty cycle, and temperature. It can also test diodes and continuity.

- **Operating Altitude:** 2000 m
- **Relative Humidity:** < 75%
- **Operating Temperature:** 0°C / 32°F to 40°C / 104°F
- **Storage Temperature:** -20°C / -4°F to 60°C / 140°F < 80% R.H.
- **Accuracy Temperature:** 18°C / 64°F to 28°C / 82°F
- **Temperature Coefficient:** 0.1% (specified accuracy) / °C
- **Sampling Frequency:** 3 samples per second
- **Dimensions:** 7" x 3.5" x 1.875" (178 mm x 89 mm x 48 mm)
- **Weight:** 14 oz. (397 g)
- **Calibration:** Accurate for one year
- **Accuracy:** ± (% of reading + # of least significant digits)
- **Drop Protection:** 2 m (6 ft.)
- **Safety Rating:** CAT III 1000V, CAT IV 600V

### ⚠ WARNINGS

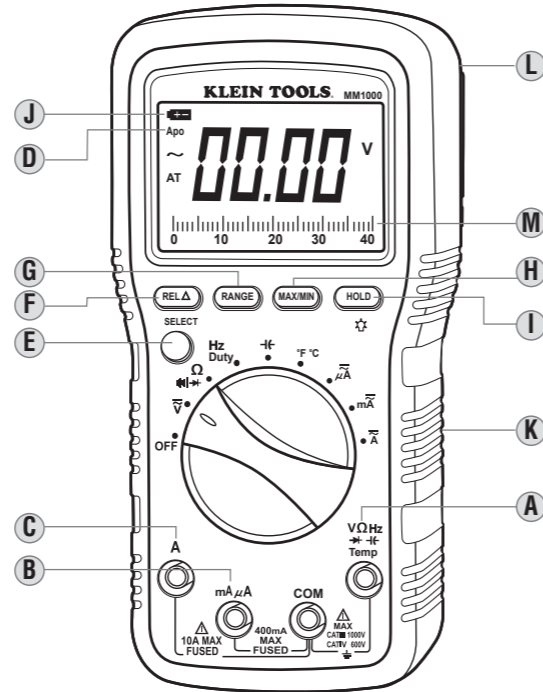
To ensure safe operation and service of the tester, follow these instructions. Failure to observe these warnings can result in severe injury or death.

- Before each use, verify meter operation by measuring a known voltage or current.
- Never use the meter on a circuit with voltages that exceed the category based rating of this meter.
- Do not use the meter during electrical storms or in wet weather.
- Do not use the meter or test leads if they appear to be damaged.
- Ensure meter leads are fully seated, and keep fingers away from the metal probe contacts when making measurements.
- Do not open the meter to replace batteries while the probes are connected.
- Use caution when working with voltages above 60V DC, or 25V AC RMS. Such voltages pose a shock hazard.
- To avoid false readings that can lead to electrical shock, replace batteries if a low battery indicator appears.
- Unless measuring voltage or current, shut off and lock out power before measuring resistance or capacitance.
- Always adhere to local and national safety codes. Use individual protective equipment to prevent shock and arc blast injury where hazardous live conductors are exposed.

### SYMBOLS

- ~ AC Alternating Current
- ⚠ Warning or Caution
- ⎓ DC Direct Current
- ⊠ Double Insulated Class II
- ⎓ DC/AC Voltage or Current
- ⊞ AC Source
- ⏚ Ground

### FEATURE DETAILS



### FEATURE DETAILS

- A. B. C. Use CAT III / CAT IV rated leads.**
- A. Do not attempt to measure more than 1000V.**
- B. Do not attempt to measure more than 400mA.**
- C. Do not attempt to measure more than 10A.**
- D. Auto Power-Off (Apo)**
- Device will power off after 30 minutes non-use.
  - Turn the dial or press a button to wake.
  - Disabled during Max / Min function.
  - Holding Select button while turning on disables Auto Power-Off.
- E. Select Functionality Button**
- Switch between AC and DC.
  - Switch between  $\Omega$ ,  $\rightarrow$ , and  $\text{diode}$ .
  - Switch between **Hz** and **%**.
  - Switch between **°F** and **°C**.
- F. Relative Reading Mode**
- Press to store current value.
  - Display will now show the difference between the stored and live readings.
  - Press again to return to live reading.
- G. Auto / Manual Range**
- Press repeatedly to cycle through manual ranges.
  - Press for 2 seconds to return to auto ranging mode.
  - **AT** is displayed on LCD only during auto ranging mode.

- H. Max / Min Hold**
- Press to enter Max / Min mode; the largest and smallest values will be saved while in this mode.
  - Press repeatedly to alternate between the maximum and minimum readings.
  - Press for 2 seconds to return to live reading and clear the stored maximum and minimum values.
- I. Hold / Backlight**
- Press to hold the current input on the display.
  - Press again to return to live reading.
  - Press for 2 seconds to enable/disable lights.
  - Using lights drains the battery significantly.
- J. K. Battery / Fuse Replacement**
- When  $\text{bat}$  indicator is displayed on the LCD, batteries must be replaced.
  - Remove rubber boot, back screw, and replace 2 x AAA batteries.
  - This meter uses 440mA / 1000V and 11A / 1000V fast blow fuses.
- L. Magnetic Hanger Accessory (optional, sold separately)**
- Slide magnetic adapter into protective rubber boot.
  - Attach instrument to metal for hands-free use.
- M. Bar Graph**
- The bar graph shows an approximate analog representation of a measurement.
  - The bar graph responds much faster than the digital display.
  - The scale of the bar graph is zero to the maximum reading of the selected range.

### FUNCTION INSTRUCTIONS

- 1. AC / DC Voltage: < 1000V**
- Features: **REL** **HOLD** **RANGE** **MAX/MIN**
- 
- Select AC or DC voltage source.

- 2. AC / DC Current (large): < 10A**
- Features: **REL** **HOLD** **RANGE** **MAX/MIN**
- 
- Start with this setting if current level is unknown.
  - Attach red lead to "A" input.
  - Select AC or DC current source.
- 3. AC / DC Current (small): < 400mA**
- Features: **REL** **HOLD** **RANGE** **MAX/MIN**
- 
- Attach red lead to "mA $\mu$ A" input.
  - Select  $\mu$ A or mA, and AC or DC current source.
- 4. Resistance / Diode / Continuity**
- 
- TO SELECT**
- $\Omega$  Resistance
  - $\rightarrow$  Diode
  - $\text{diode}$  Continuity
- RESISTANCE FEATURES:**
- HOLD** **RANGE** **MAX/MIN** **REL**
- **⚠ Do not** measure resistance on a live circuit.
  - $\Omega$  < 40M $\Omega$
- DIODE FEATURES:**
- HOLD** **MAX/MIN**
- Display shows:
- Forward voltage drop if forward biased.
  - "O.L." if reverse biased.
- CONTINUITY FEATURES:**
- HOLD** **MAX/MIN**
- Display shows: Resistance
- Buzzer sounds if less than 30 $\Omega$
- 5. Capacitance: < 4000 $\mu$ F**
- Features: **HOLD**
- 
- **⚠** Safely discharge capacitor before measurement.
  - Reading may take up to 60 seconds for large capacitors.