

# MM-810 MULTIMETER

TESTING | TROUBLESHOOTING | ACCURACY

## Product Features:

The MM-810 from Tempo Communications is a high precision, True-RMS (TRMS), dual display multimeter with all the measurement features you're likely to need. The MM-810 is an advanced multimeter for professional technicians.

Built to international safety standards the MM-810 performs all the tests any electrician would want with the added precision of true-RMS response for AC measurements. Features like "BeepJack" enhance safety and help prevent damage when leads are attached to the wrong terminals for the type of test selected. Fully auto ranging or manual—the choice is yours. The backlit LCD helps when testing in those awkward cupboards.

Supplied with a zipper case and high-quality safety test leads:

1. True RMS response for AC measurements
2. Dual display allows, for example AC V and frequency
3. Fast response 41 segment "bar-graph" with 60 updates per second
4. 9999 or 6000 Count large digit LCD with 5 updates per second
5. Core accuracy better than 0.1%
6. Millivolt and microampere ranges for precision measurements
7. Measurements
  - Voltage (ac or dc)
  - Current (ac or dc)
  - Continuity
  - Resistance
  - Conductance
  - Capacitance
  - Diode
  - Frequency
  - Duty Cycle



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## Accuracy: AC Voltage

Range	Accuracy at 50 to 60 Hz	Accuracy at 40 to 500 Hz	Accuracy at 500 Hz to 1 kHz	Accuracy at 1 to 3 kHz	Accuracy at 3 to 20 kHz
60.00 mV	± (0.5% + 0.03 mV)	± (0.8% + 0.04 mV)	± (2.0% + 0.03 mV)	± (2% + 0.03 mV)	± (2% + 0.03 mV) <sup>(1)</sup>
600.0 mV	± (0.5% + 0.3 mV)	± (0.8% + 0.4 mV)	± (2.0% + 0.3 mV)	± (2% + 0.3 mV)	± (2% + 0.3 mV) <sup>(1)</sup>
9.999 V	± (0.5% + 0.003 V)	± (1.0% + 0.004 V)	± (1.0% + 0.004 V)	± (3% + 0.004 V)	3 dB
99.99 V	± (± (0.5% + 0.03 V)	± (1.0% + 0.04 V)	± (1.0% + 0.04 V)	± (3% + 0.04 V)	3 dB
999.9 V	± (0.5% + 0.3 V)	± (2.0% + 0.4 V)	± (2.0% + 0.4 V)	± (3% + 0.4 V)	Unspecified

(1) Specified from 30% to 100% of range  
Input Impedance: 10 MΩ, 50 pF nominal (80 pF nominal for 600 mV range)

### RESISTANCE AND CONDUCTANCE

Range	Accuracy	Typical Open Circuit Voltage
600.0 Ω	± (0.1% + 0.3 Ω)	1.2 VDC
6.000 kΩ	± (0.1% + 0.003 kΩ)	
60.00 kΩ	± (0.1% + 0.03 kΩ)	
600.0 kΩ	± (0.1% + 0.3 kΩ)	
6.000 MΩ	± (0.4% + 0.003 MΩ)	
60.00 kΩ	± (1.5% + 0.05 MΩ)	1.2 VDC
99.99 nS	± (0.8% + 0.1 nS)	

### ACCURACY FOR FREQUENCY RANGES

Display Range	Accuracy
99.99 Hz	± (0.04% + 0.04 Hz)
999.9 Hz	± (0.04% + 0.4 Hz)
9.999 kHz	± (0.04% + 0.004 kHz)

## Specifications:

<b>Display:</b>	9999 counts: ACV, DCV, Hz, and nS 6000 counts: mV, μA, mA, A, ohm, and capacitance
<b>Polarity:</b>	Automatic
<b>Sampling Rate:</b>	Numeric Display: 5 per second 41-Segment Bar Graph Display: 60 per second
<b>Temperature Coefficient:</b>	Nominal 0.15 x (specified accuracy) per °C below 18 °C or above 28 °C
<b>Automatic Power Off:</b>	After 30 minutes of inactivity
<b>Noise Rejection*:</b>	Normal Mode Rejection Ratio > 60 dB at 50 Hz and 60 Hz when measuring DCV Common Mode Rejection Ratio > 60 dB from 0 Hz to 60 Hz when measuring ACV Common Mode Rejection Ratio > 120 dB at 0 Hz, 50 Hz and 60 Hz when measuring DCV
<b>Operating Conditions:</b>	0 °C to 45 °C (32 °F to 113 °F), 0% to 80% relative humidity (non-condensing)
<b>Storage Conditions:</b>	-20 °C to 60 °C (-4 °F to 140 °F)
<b>Battery:</b>	9-Volt (NEDA 1604, JIS 006P or IEC 6F22)
<b>μA and mA:</b>	0.44 A/1000 V DC/AC rms, interrupting rating 10 kA, F fuse, 13/32" x 1-1/2"
<b>A:</b>	11 A/1000 V DC/AC rms, interrupting rating 20 kA, F fuse, 13/32" x 1-1/2"
<b>V:</b>	1100 V DC/AC rms
<b>mV, Ω, and Other Functions:</b>	1000V DC/AC rms
<b>Safety:</b>	Double insulation per IEC/UL/EN61010-1 Ed. 3.0, IEC/EN61010-2-030 Ed. 1.0, IEC/EN61010-2-033 Ed. 1.0, IEC/UL/EN61010-031 Ed. 1.1 and CAN/CSA-C22.2 No. 61010-1-12 Ed. 3.0 to Category IV 1000 VAC and VDC
<b>All Terminals:</b>	Category IV 1000 VAC and VDC

\* Noise rejection is the ability to reject unwanted signals, or noise.

• Normal mode voltages are AC signals that can cause inaccurate DC measurements. NMRR (Normal Mode Rejection Ratio) is a measure of the ability to filter out these signals.

• Common mode voltages are signals present at the COM and + input terminals, with respect to ground, that can cause digit rattle or offset in voltage measurements. CMRR (Common Mode Rejection Ratio) is a measure of the ability to filter out these signals.

## Line Level Frequency

Frequency	Sensitivity (Sine RMS)	Range
60.00 mV	40 mV	15.00 Hz to 50.00 kHz
600.0 mV	60 mV	15.00 Hz to 50.00 kHz
9.999 V	2.5 V	15.00 Hz to 10.00 kHz
99.99 V	25 V	15.00 Hz to 10.00 kHz
999.9 V	100 V	15.00 Hz to 10.00 kHz
600.0 μA	45 μA	15.00 Hz to 3.000 kHz
6000 μA	600 μA	15.00 Hz to 3.000 kHz
60.00 mA	40 mA	15.00 Hz to 3.000 kHz
600.0 mA	60 mA	15.00 Hz to 3.000 kHz
6.000 A	4 A	15.00 Hz to 3.000 kHz
10.00 A	6 A	15.00 Hz to 3.000 kHz

### CAPACITANCE

Range	Accuracy <sup>(1)</sup>
60.00 nF	± (0.8% + 0.03 nF)
600.0 nF	± (0.8% + 0.3 nF)
6.000 μF	± (1.0% + 0.003 μF)
60.00 μF	± (2.0% + 0.03 μF)
600.0 μF <sup>(2)</sup>	± (3.5% + 0.5 μF)
6.000 mF <sup>(2)</sup>	± (5.0% + 0.005 mF)
25.00 mF <sup>(2)</sup>	± (6.5% + 0.05 mF)

### DC VOLTAGE

Range	Accuracy
60.00 mV	± (0.12% + 0.02 mV)
600.0 mV	± (0.06% + 0.2 mV)
9.999 V	± (0.08% + 0.002 V)
99.99 V	± (0.08% + 0.02 V)
999.9 V	± (0.08% + 0.2 V)

### AC CURRENT

Range	Accuracy at 50 to 60 Hz	Accuracy at 40 to 1 kHz	Burden Voltage (typical) (all frequency ranges)
600.0 μA	± (0.6% + 0.3 μA)	± (0.8% + 0.4 μA)	0.08 mV/μA
6000 μA	± (0.6% + 3 μA)	± (0.8% + 4 μA)	
60.00 mA	± (0.6% + 0.03 mA)	± (0.8% + 0.04 mA)	2.1 mV/mA
600.0 mA	± (1.0% + 0.3 mA)	± (1.0% + 0.4 mA)	
6.000 A	± (0.8% + 0.006 A)	± (0.8% + 0.006 A)	0.02 V/A
10.00 A	± (0.8% + 0.06 A)	± (0.8% + 0.06 A)	

### DC CURRENT

Range	Accuracy at 50 to 60 Hz Accuracy at 40 to 1 kHz	Burden Voltage (typical) (all frequency ranges)
600.0 μA	± (0.2% + 0.4 μA)	0.08 mV/μA
6000 μA	± (0.2% + 4 μA)	
60.00 mA	± (0.2% + 0.04 mA)	2.1 mV/mA
600.0 mA	± (0.2% + 0.4 mA)	
6.000 A	± (0.2% + 0.004 A)	0.02 V/A
8.00 A*	± (0.2% + 0.04 A)	

(1) Accuracies with film capacitor or better

(2) In manual ranging mode, measurements are not specified below 50.0 μF, 0.54 mF, and 5.4 mF for 600.0 μF, 6.000 mF and 25.00 mF ranges, respectively

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