

MODEL 500

- 3³/₄-digit, 4000 count LCD dual digital display with bargraph and backlight
- True RMS voltage measurements
- Decibel, Capacitance and Inductance measurements
- Temperature measurement in Centigrade and Fahrenheit
- Timer and Frequency Counter (up to 10 MHz) functions
- Signal Out Function
- Logic Level Check
- Low Current Range (400 μ A), Continuity, and Diode testing
- 10 Data Memory Locations
- MAX/MIN/AVG and Relative Modes
- Data hold feature freezes readings.
- Auto Power Off/Keep on Modes and Low battery Indication
- RS-232 interface and software for downloading measurements to a PC
- CE Approved

Model 500 3³/₄-Digit True RMS Digital Multimeter

TEGAM's Model 500 Digital Multimeter combines a broad range of features and measurement capabilities

in an easy-to-use, cost-effective package. The Model 500 measures DC, AC, and true RMS voltage, current, and resistance, as well as temperature, inductance, capacitance, frequency, and time. Continuity test, diode test, and TTL logic monitoring simplify troubleshooting. Its RS-232



3³/₄-Digit True RMS Digital Multimeter

interface and Windows® software enable the Model 500 to be used with a personal computer for, automated data collection, graphing, and analysis. The Model 500 contains 10 data memories for storing measurements.

Display and Controls

The Model 500 uses a back-lit, 3³/₄-digit (4000 count) liquid crystal display (LCD) that features dual numeric readouts, annunciators, and a bargraph to show signal trends. The secondary digital “subdisplay” shows information related to the main display. *For example, when the main display shows temperature in degrees C, the secondary display shows the corresponding Fahrenheit temperature.* The bargraph gives rapid indication of signal trends, or small changes in signal level. Auto power off/Keep on modes and a Low Battery indicator help users conserve battery life. Intuitive controls consist of a large rotary selector dial and eight pushbuttons that control power and other measurement parameters.



MODEL 500

4000 Count Digital Multimeter with True RMS and RS-232

Advanced Features

The Model 500 performs a wide variety of functions, that would normally require the use of several independent instruments

- Inductance, Capacitance, and Frequency measurement.
- Logic Monitor function – detects TTL signal levels (hi, low, or undetermined).
- Pulse Generator – outputs square waves at nominal 2, 4, or 8 kHz.
- Diode Test function - for easy assessment of diode junction condition.
- Continuity test – for fast, qualitative troubleshooting.

- Decibel measurements
- Timer and Stopwatch functions
- Minimum, Maximum, and Average modes – find or calculate important data values from a set of measurements.
- “Relative” mode – shows measurements referenced to a stored (non-zero) reference value

operate with a Windows® based PC as a virtual instrument. Multiple readings can be captured, stored, and processed with ease. When used with a computer, measurement modes can be controlled remotely from the computer.

Computer Interface

The Model 500 includes a CD of software utilities, and an RS-232 interface that enables the meter to

Specifications

DCV

Range:	400 mV, 4 V, 40 V, 400 V, 1000 V
Accuracy:	±(0.5% reading + 5 digits)
Input Impedance:	1 GΩ on 400 mV range, 10 MΩ on all other ranges.
Best Resolution:	0.1 mV on 400 mV range
Maximum Input Voltage:	1000 Vdc.

ACV

Range:	400 mV, 4 V, 40 V, 400 V, 750 V																		
Accuracy:	±(1.5% reading + 20 digits), 50 Hz to 500 Hz																		
Crest Factor:	<table><thead><tr><th>Waveform</th><th>Crest Factor</th><th>Additional Error</th></tr></thead><tbody><tr><td>Square</td><td>1</td><td>0.2%</td></tr><tr><td>Sine</td><td>1.414</td><td>0%</td></tr><tr><td>Trangle</td><td>1.73</td><td>0.3%</td></tr><tr><td>Others</td><td>2</td><td>0.5%</td></tr><tr><td>Others</td><td>3</td><td>1.7%</td></tr></tbody></table>	Waveform	Crest Factor	Additional Error	Square	1	0.2%	Sine	1.414	0%	Trangle	1.73	0.3%	Others	2	0.5%	Others	3	1.7%
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Input Impedance:	1 GΩ shunted with <3 nF on 400 mV range 10 MΩ shunted with <100 pF on all other ranges.
Best Resolution:	0.1 mV on 400 mV range
Maximum Input Voltage:	750 Vac

DC Current

Ranges:	400 μA, 400 mA, 20 A (max 30 sec. for 10 A to 20 A)
Accuracy:	±(1% reading + 2 digits)
Voltage Burden:	1 mV/μA 1 mV/mA 10 mV/A
Best Resolution:	0.1 μA on 400 μA range
Overload Protection:	PTC, 0.5 A and 20 A fuse

Specifications (continued)

AC Current

Ranges: 400 μ A, 400 mA, 20 A (max 30 sec. for 10 A to 20 A)

Accuracy: $\pm(1.5\%$ reading + 3 digits), 50 Hz to 100 Hz

$\pm(3.05\%$ reading + 5 digit), 100 Hz to 1 KHz

Voltage Burden: 1 mV/ μ A

1 mV/mA

10 mV/A

Crest Factor:

Waveform	Crest Factor	Additional Error
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Square	1	0.2%
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Sine	1.414	0%
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Triangle	1.73	0.3%
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Others	2	0.5%
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Others	3	1.7%
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Best Resolution: 0.1 μ A on 400 μ A range

Overload Protection: PTC, 0.5 A and 20 A fuse

Resistance

Ranges: 400 Ω , 4 k Ω , 40 k Ω , 400 k Ω , 4 M Ω , 40 M Ω ,

Accuracy: $\pm(0.5\%$ reading + 2 digits), 400 Ω to 400 k Ω

$\pm(1\%$ reading + 2 digits), 400 k Ω to 40 M Ω

Open Circuit Voltage: 1.2 V, except 2.5 V on 400 Ω range

Best Resolution: 0.1 Ω on 400 Ω range

Maximum Input Voltage: 250 Vdc or rms

Decibel

Ranges: -25.74 to +59.71 dBm (4 V to 750 V) in 4 overlapping ranges

Accuracy: ± 0.5 dB, 30 Hz to 1 kHz

Best Resolution: 0.1 dBm

Input impedance: 10 M Ω shunted by <100 pF

Capacitance

Ranges: 100 μ F

Accuracy: $\pm(3\%$ reading + 5 digits)

Best Resolution: 0.01 μ F

Inductance

Ranges: 100 H

Accuracy: $\pm(3.0\%$ reading + 5 digits) up to 20 H

$\pm(5.0\%$ reading + 5 digits) up to 50 H

$\pm(10.0\%$ reading + 5 digits) up to 100 H

Best Resolution: 0.01 H

Inductor Q >10 and coil resistance <100 Ω

Diode Test

Open Circuit Voltage: 3.3 V Max

Test Current: 1 mA typical (uses 4 V range)

Voltage drop for "good": 0.5 V to 1.0 V

MODEL 500

Specifications (continued)

Zener Diode Test

Ranges: 15.00 V
Accuracy: $\pm(5\% + 10 \text{ digits})$
Test: 15 to 22 V @ 1 mA

Continuity Test

Buzzer: Sounds at less than 100 Ω
(400W range)
Open circuit voltage: 2.5 V typical

Temperature

Ranges: -20° to 1200°C
 -4° to 2100°F
Thermocouple: K type
Display: $^{\circ}\text{C}$, $^{\circ}\text{F}$
Accuracy: $\pm(3.0\% \text{ reading} + 5 \text{ digits})$,
 -20° to 10°C
 $\pm(3.0\% \text{ reading} + 3 \text{ digits})$,
up to 350°C
 $\pm(5.0\% \text{ reading} + 3 \text{ digits})$,
up to 1200°C
Resolution: 1°C

$^{\circ}\text{F}$ on LCD sub digit display is calculated and displayed by the formula $^{\circ}\text{F} = 32 + (9/5 \times ^{\circ}\text{C})$ Room temp. is displayed with no sensor attached.

Frequency

Ranges: 10 kHz, 100 kHz, 1 MHz, 10 MHz
Accuracy: $\pm(0.01\% + 2 \text{ digits})$
Best Resolution: 1 Hz

Logic (TTL) Test

Voltage for "Lo" $<0.8 \text{ V}$
Voltage for "Hi" $>2.0 \text{ V}$
Undetermined 0.8 V to 2.0 V

Signal Out

Frequencies: 2048, 4096, 8192 kHz
Waveform: Square wave, 50% duty cycle
Output Voltage: 4.0 Vp-p Min, 4.5 Vp-p typical, at N/L
Accuracy: $\pm 0.1\%$
Source Impedance: 1.5 K Ω

Time Count

Range: 10 hours
Resolution: 1 second
Mode: Count up or count down
Accuracy: $\pm(0.2\% \text{ reading} + 1 \text{ digit})$
Alarm: Sounds at 9 hr, 59 min, 59 sec. in count up mode, or 0 hr, 0 min, 0 sec. in count down mode

General Specifications

Display: 3 3/4-digits (4000 count resolution), dual digital with bargraph
Update Rate: 2/second
Data Memory: 10 memories for measurement storage
RS-232 Output Medium: Infrared
Operating Temperature: 0° to 40°C at $<80\%$ relative humidity
Power: 9 V battery: carbon zinc or alkaline NEDA 1604 or equivalent. Typical carbon zinc cell life: 36 hours continuous operation
Safety: CE approved
Dimensions: Width: 3.47 inches (88 mm)
(without holster) Height: 7.84 inches (199 mm)
Depth: 1.47 inches (37 mm)
Weight: 14.5 oz (410 gm)
Operating System: Supplied software compatible with MS Windows[®] 3.1/95/98
Standard
Accessories: Protective holster, manual, safety probes, temperature adapter and probe, RS-232 cable, and CD ROM
Warranty: The Model 500 Digital Multimeter is warranted against defects in workmanship and materials for two years.