

**NULL mode** operates with all functions which enables the unit to add or subtract an offset to make relative measurements.

**HOLD mode** stops the instrument from measuring and displays the last measurement made. The HOLD key toggles the instrument between HOLD and RUN modes.

**The TRIG key** lets you make a single measurement and then automatically return to HOLD.

**COMPARE mode** makes it possible to compare measurements against user-defined HI and LO limits. A beeper indicates when a measurement is out of limits.

**Temperature measurements** are made using a platinum resistance probe. DM 5110/511 will measure temperatures from -62° to 240°C.

### Electrical Characteristics

#### DC Volts

**Accuracy** (4-1/2 digits, auto or manual ranging, front or rear input):

Range	+18° to +28°C	0° to +18°C, +28° to +50°C
200 mV	±(0.05% of reading + 0.015% of full scale)	±(0.15% of reading + 0.04% of full scale)
2V	±(0.05% of reading + 0.01% of full scale)	±(0.1% of reading + 0.02% of full scale)
20V	±(0.05% of reading + 0.015% of full scale)	±(0.15% of reading + 0.025% of full scale)
200V	±(0.05% of reading + 0.01% of full scale)	±(0.1% of reading + 0.02% of full scale)
1000V	±(0.05% of reading + 0.02% of full scale)	±(0.1% of reading + 0.02% of full scale)

**CMRR (with 1 kΩ unbalance)** —  
≥100 dB @ dc, ≥80 dB @ 50/60 Hz.

**NMRR** — ≥50 dB @ 50/60 Hz (±0.2 Hz).

**Max. Resolution** — 10 μV.

**Step Response Time** — <50 msec to 0.05% of step.

**Input Resistance** — 10 mΩ ±0.5%.

**Max. Input Voltage** — Front panel, LOW to GND and V/Ω/Temp to LOW or GND: 1000 V pk; Rear connector, HI to LO and HI or LO to Chassis: 60 V dc + pk ac.

#### True RMS AC Volts

**Accuracy** (4-1/2 digits, auto or manual ranging, front or rear input, 200 mV to 500 V range):

Input Frequency	+18° to +28°C	0° to +18°C, +28° to +50°C
20 Hz to 100 Hz (see note 1)	±(0.8% of reading + 0.05% of full scale)	±(1.1% of reading + 0.075% of full scale)
100 Hz to 10 kHz (see note 1)	±(0.3% of reading + 0.05% of full scale)	±(0.6% of reading + 0.075% of full scale)
10 kHz to 20 kHz (see note 2)	±(0.6% of reading + 0.05% of full scale)	±(0.9% of reading + 0.05% of full scale)
20 kHz to 50 kHz: (see note 3)	±(1.0% of reading + 0.05% of full scale)	±(1.3% of reading + 0.075% of full scale)

**Notes:**  
1. For inputs > 200 counts, 200 mV to 200 V ranges, > 50 counts, 500 V range.  
2. For inputs > 500 counts, 200 mV to 200 V ranges, > 250 counts, 500 V range.  
3. For inputs > 2000 counts, 200 mV to 200 V ranges, > 500 counts, 500 V range.

**CMRR (with 1 kΩ unbalance)** —  
≥60 dB @ 50/60 Hz.

**Max. Resolution** — 10 μV.

**Response Time** — <0.3 sec to 1% of step.

**Input Impedance** — 2 MΩ ±0.1%,  
paralleled by <50 pF.

**Max. Input Voltage** — Front panel, V/Ω/Temp to LOW: 500 V rms or 600 V dc; Front panel, V/Ω/Temp or LOW to GND: 1000 V pk; Rear connector, HI to LO and HI or LO to Chassis: 60 V dc + pk ac.

**Crest Factor** — 3:1 for 0.1% additional error.

## dB (True RMS AC Voltage)

**Accuracy** (4-1/2 digits, auto or manual ranging, front or rear input):

Range, dBV	Range, dBm	+18° to +28°C	0° to +18°C +28° to +50°C	Frequency
-34 to +54	-32 to +56	±0.3 dB	±0.4 dB	20 Hz-20 kHz
-54 to -34	-52 to -32	±0.6 dB	±0.8 dB	20 Hz-10 kHz
-60 to -54	-58 to -52	±1.0 dB	±1.5 dB	20 Hz-10 kHz

**Max. Resolution** — 0.01 dB.

**Response Time** — <0.3 sec to 1% of step.

**Input Impedance** — 2 M $\Omega$  ±0.1%, paralleled by <50 pF; Front panel, V/ $\Omega$ /Temp to LOW:

500 V rms or 600 V dc; Front panel, V/ $\Omega$ /Temp or LOW to GND: 1000 V pk; Rear connector, HI to LO and HI or LO to Chassis: 60 V dc + pk ac.

## Ohms

**Accuracy** (4-1/2 digits, auto or manual ranging, front or rear input):

Range	+18° to +28°C	0° to +18°C, +28° to +50°C	Source Current	Vax
200 $\Omega$	±(0.05% of reading + 0.02% of full scale)	±(0.25% of reading + 0.04% of full scale)	1.0 mA	0.2 V
2 k $\Omega$	±(0.05% of reading + 0.01% of full scale)	±(0.25% of reading + 0.03% of full scale)	1.0 mA	2.0 V
20 k $\Omega$	±(0.05% of reading + 0.02% of full scale)	±(0.25% of reading + 0.04% of full scale)	10 $\mu$ A	0.2 V
200 k $\Omega$	±(0.05% of reading + 0.01% of full scale)	±(0.25% of reading + 0.03% of full scale)	10 $\mu$ A	2.0 V
2 M $\Omega$	±(0.1% of reading + 0.02% of full scale)	±(1.0% of reading + 0.04% of full scale)	0.1 $\mu$ A	0.2 V
20 M $\Omega$	±(0.1% of reading + 0.01% of full scale)	±(1.0% of reading + 0.03% of full scale)	0.1 $\mu$ A	2.0 V

**Response Time** — <0.2 sec, 200  $\Omega$  to 2 M $\Omega$  ranges; <2 sec 20 M $\Omega$  range.

**Max. Input Voltage, All Ranges** — Front Panel: 300 V pk; Rear Connector: 60 V pk.

**Max. Resolution** — 10 m $\Omega$ .

**Max. Open-Circuit Voltage** — <11V.

## DC Amps

**Accuracy** (4-1/2 digits, auto or manual ranging, front panel only):

Range	+18° to +28°C	0° to +18°C, +28° to +50°C
200 $\mu$ A, 2 mA, 20 mA	±(0.1% of reading + 0.01% of full scale)	± (0.3% of reading + 0.025% of full scale)
200 mA, 2000 mA		

**Response Time** — <50 msec to 0.05% of step.

**Input Resistance** —

Range	$\approx$ Resistance
200 $\mu$ A	1.0 k $\Omega$
2 mA	100 $\Omega$
20 mA	10.2 $\Omega$
200 mA	1.2 $\Omega$
2000 mA	.26 $\Omega$

**Max Open-Circuit Input Voltage**

(mA to LOW) — 250 V pk.

**Max Input Current** — 2 A any range.

**Max Floating Voltage** — 1000 V pk, mA or LOW to GND.

**Max Resolution**—10 nA.



# TM 500 / 5000

## MODULAR TEST INSTRUMENTS

### AC Amps

**Accuracy** (4-1/2 digits, auto or manual ranging, front panel only, all ranges):

Frequency	+18° to +28°C	0° to +18°C, +28° to +50°C
20 Hz to 100 Hz (input > 200 counts)	±(0.8% of reading + 0.05% of full scale)	±(1.1% of reading + 0.075% of full scale)
100 Hz to 10 kHz (input > 200 counts)	±(0.3% of reading + 0.05% of full scale)	±(0.6% of reading + 0.075% of full scale)

**Crest Factor** — 3:1 for 0.1% additional error.

**Response Time** — <0.3 sec to 1% of step.

**Input Resistance** —

Range	≈ Resistance
200 μA	1.0 kΩ
2 mA	100 Ω
20 mA	10.2 Ω
200 mA	1.2 Ω
2000 mA	.4 Ω

**Max Open-Circuit Input Voltage (mA to LOW)** — 250 V pk.

**Max Input Current** — 2 A any range.

**Max Floating Voltage** — 1000 V pk,  
mA or LOW to GND.

**Max Resolution** — 10 nA.

### Temperature

**Accuracy** (4-1/2 digits, front panel, input only):

Measurement Range	+18° to +28°C	0° to +18°C, +28° to +50°C	Probe Status
-62° to +150°C	±0.6°C	±1.5°C	Instrument calibrated to probe
+150° to +240°C	±1.6°C	±2.5°C	
-62° to +150°C	±3.5°C	±4.5°C	Any probe
+150° to +240°C	±6.0°C	±7.0°C	

### Miscellaneous

**Reading Rate** — 4.5 Digits (NORMAL):  
>3/sec; 3.5 Digits (FAST): >25/sec.

**Power Consumption** — <10 W.

**Over-range Indication** — Flashing display.

**Warm-up Time** — 30 minutes (60 minutes  
after storage in high humidity environment).

### Environmental Specifications

**Temperature** — Operating: 0° to +50°C;  
Non-Operating: -55° to +75°C.

**Humidity** — <95%, 0° to +30°C; <75%,  
+30° to +40°C; <45%, above +40°C.

**Altitude** — Operating: 4.6 km (15,000 ft);  
Non-Operating: 15 km (50,000 ft).

### Physical Characteristics

**Net weight** — DM 5110: 1.1 kg  
(2.45 lb); DM 511: 1.0 kg (2.2 lb).

**Dimensions** — Single TM 5000/500  
compartment; ≈ 67 mm (2.63 in) W x 285 mm  
(11.24 in) D x 126 mm (4.96 in) H.

TM 5006A	6 Wide Power Module Mainframe, GPIB
TM 5006A/R	TM 5006A w/Rack Mount
TM 5006A/RI	TM 5006A w/Rear Interface
TM 5006A/R/RI	TM 5006A w/Rack Mt & Rear Interface
TM 5006A/EMC	TM 5006A w/EMC Shielding

### Mainframe Power Plug Options

Standard	120V North American
UE220	220V Universal Euro & Switzerland
UK240	240V United Kingdom
A240	240V Australian
NA240	240V North American
S220	220V Switzerland

### Warranty

One year on materials and workmanship.

### Calibration Documentation

Contact TEGAM for OPTION Z540 NIST  
Traceable Compliance Certificate and  
Test Data.

### Calibration & Technical Services

For warranty and remedial repair,  
calibration services and spare parts, or for  
additional information on TEGAM sales  
and service offices around the world,  
contact us at 440-466-6100 (ph) or  
440-466-6110 (fx).

### Ordering Information

DM 5110 Prgm. Autoranging Digital  
Multimeter

DM 511 Autoranging Digital Multimeter

Both Include:

Instruction Manual (070-7478-00),  
Instrument Interfacing Guide (070-7560-00),  
Reference Guide (070-7559-00),  
Meter Leads, Set (196-3212-00)

TM 502A	2 Wide Power Module Mainframe
TM 502A/TB	TM 502A w/Tool Box Plug-In
TM 503B	3 Wide Power Module Mainframe
TM 5003	3 Wide Power Module Mainframe, GPIB
TM 5003/RI	TM 5003 w/Rear Interface



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