



DM 501A

- 0.05% DC Voltage Accuracy
- Seven Functions Including Temperature and dB
- 4½ Digit Display
- True RMS Capability

The DM 501A Digital Multimeter measures dc and ac voltage, dc and ac current, resistance, dB, and temperature. The DM 501A gives 4 digits of readout resolution, all with 0.05% accuracy and true RMS capability. True RMS allows accurate measurement of distorted waveforms. Readout in dB is useful when making critical audio and communication measurements. Fast accurate temperature measurements to 240 °C come from the Tektronix P6601 platinum-film temperature sensing probe. The P6601 reaches 90% of final reading in 1.5 seconds. Power consumption is approximately 9 V A.

CHARACTERISTICS

DC VOLTS

Ranges—200 mV, 2 V, 20 V, 200 V, and 1000 V.

Accuracy*1

18°C to 28°C

Voltage Ranges	Normal and Fast Conversion Rate
200 mV	±[0.05% of reading +0.015% of full scale (3 counts)]
2 V to 200 V	±[0.05% of reading +0.01% of full scale (2 counts)]
1000 V	±[0.05% of reading +0.02% of full scale (2 counts)]

0 to 18°C, 28 to 50°C

200 mV to 200 V	±[0.1% of reading +0.025 of full scale (5 counts)]
1000 V	±[0.1% of reading ±0.05% of full scale (5 counts)]

*1 Valid for six months or 1000 hours, whichever occurs first.

Common-Mode Rejection Ratio— ≥ 100 dB at dc ≥ 80 dB at 50 Hz and 80 Hz with 1 k Ω imbalance.

Normal-Mode Rejection Ratio— ≥ 60 dB at 50 Hz or 60 Hz ± 0.2 Hz.

Maximum Resolution—10 μ V.

Step Response Time— < 1 s.

Input Resistance—10 M Ω .

Maximum Input Voltage—1000 V peak.

TRUE RMS AC VOLTS

Input Signal—Must be between 5 and 100% of full scale.

Ranges—200 mV, 2 V, 20 V, 200 V, and 500 V (ac coupled).

Accuracy*1

18 to 28°C			
Voltage Ranges	20 Hz to 40 Hz	40 Hz to 10 kHz	10 kHz to 20 kHz
200 mV to 200 V	$\pm[1\%$ of reading +0.05% of full scale (10 counts)]	$\pm[0.6\%$ of reading +0.05% of full scale (10 counts)]	$\pm[1\%$ of reading +0.05% of full scale (10 counts)]
500 V	$\pm[1\%$ of reading +0.2% of full scale (10 counts)]	$\pm[0.6\%$ of reading +0.2% of full scale (10 counts)]	$\pm[1\%$ of reading +0.2% of full scale (10 counts)]

18 to 28°C

Voltage Ranges	20 Hz to 40 Hz	40 Hz to 10 kHz	10 kHz to 20 kHz
200 mV to 200 V	$\pm[1.3\%$ of reading +0.075% of full scale (15 counts)]	$\pm[0.8\%$ of reading +0.075% of full scale (15 counts)]	$\pm[1.3\%$ of reading +0.075% of full scale (15 counts)]
500 V	$\pm[1.3\%$ of reading +0.3% of full scale (15 counts)]	$\pm[0.8\%$ of reading +0.3% of full scale (15 counts)]	$\pm[1.3\%$ of reading +0.3% of full scale (15 counts)]

*1 Valid for six months or 1000 hours, whichever comes first.

Common-Mode Rejection Ratio— ≥ 60 dB at 50 to 60 Hz with 1 k Ω imbalance.

Maximum Resolution—10 μ V.

Response Time— < 2 s.

Input Impedance—10 M Ω paralleled by 160 pF.

Maximum Input Voltage—500 V ac rms, 600 V dc, not to exceed 1000 V peak.

Crest Factor—4 (at full scale).

dB (TRUE RMS)

Zero dB Reference—1 mW in 600 Ω (0.775 V) (dBm) Internal jumper change for 0 dB reference of 1.0000 V (dBV).

Accuracy*1

18 to 28°C				
	20 Hz	2 kHz	10 kHz	20 kHz
	+50 to -50 dB	0		± 0.5 dB
	-50 to -60 dB	± 0.5 dB	± 1.5 dB	Typically ± 2.5 dB

*1 From 0 to 18°C, 28 to 50°C, add 0.6 dB to above accuracy specifications.

Maximum Resolution—0.1 dB.

Response Time— < 2 s.

Input Impedance—10 M Ω paralleled by < 160 pF.

Maximum Input Voltage—500 V RMS, not to exceed 1000 V peak. Equivalent to +54 dBV or +56.2 dBm.

Crest Factor—4 (at full scale)

RESISTANCE

Response Time— < 2 s in 200 Ω to 200 k Ω ranges; < 10 s in 20 M Ω range.

Maximum Input Volts—250 V peak.

Maximum Resolution—10 m Ω .

HI-LO Ohm Operation—A low voltage is user-selectable for making in-circuit ohms measurements without turning on silicon diode and transistor junctions. A high voltage is also available for testing junctions for forward and reverse resistance.

Maximum Open-Circuit Voltage Developed— < 6 V.

Ranges—200 Ω , 2 k Ω , 20 k Ω , 200 k Ω , 2000 k Ω , and 20 M Ω .

Accuracy*1

18 to 28°C		
Resistance Ranges	Normal and Fast Conversion Rate	
200 Ω	LO Ω	$\pm[0.15\%$ of reading +0.015% of full scale (3 counts)]
2 k Ω to 2000 k Ω	HI Ω	$\pm[0.15\%$ of reading +0.015% of full scale (3 counts)]
2 k Ω to 200 k Ω	LO Ω	$\pm[0.15\%$ of reading +0.015% of full scale (3 counts)]
2000 k Ω	LO Ω	$\pm[0.3\%$ of reading +0.015% of full scale (3 counts)]
20 M Ω	HI Ω	$\pm[0.15\%$ of reading +0.05% of full scale (3 counts)]

0 to 18°C, 28 to 50°C

200 Ω	LO Ω	$\pm[0.3\%$ of reading +0.025% of full scale (5 counts)]
2 k Ω to 2000 k Ω	HI Ω	$\pm[0.3\%$ of reading +0.025% of full scale (5 counts)]
2 k Ω to 200 k Ω	LO Ω	$\pm[0.3\%$ of reading +0.025% of full scale (5 counts)]
20 k Ω	HI Ω	$\pm[1.2\%$ of reading +0.025% of full scale (5 counts)]
2000 M Ω	LO Ω	$\pm[1.2\%$ of reading +0.025% of full scale (5 counts)]

*1 Valid for six months or 1000 hours, whichever occurs first.

DC AND TRUE RMS AC CURRENT

Input Signal—Must be between 5 and 100% of full scale (ac only).

Ranges—200 μ A, 2 mA, 20 mA, 200 mA, and 2000 mA.

DC Current Accuracy—18 to 28°C: $\pm[0.2\%$ of reading +0.015% of full scale (3 counts)]. 0 to 18°C and 28 to 50°C: $\pm[0.3\%$ of reading +0.025% of full scale (5 counts)].

AC Current Accuracy From 20 Hz to 10 kHz—18 to 28°C: $\pm[0.6\%$ of reading +0.05% of full scale (10 counts)]. 0 to 18°C, 28 to 50°C: $\pm[0.7\%$ of reading +0.075% of full scale (15 counts)]. Usable to 20 kHz.

Response Time— < 1 s dc current, < 2 s ac current.

Input Resistance

Ranges	Approximate Resistance
200 μ A	1.0 k Ω
2 mA	100.0 Ω
20 mA	10.2 Ω
200 mA	1.2 Ω
2000 mA	0.4 Ω

Maximum Open-Circuit Input Voltage (mA to LOW)—250 V peak, fused with 2 A fast blow.

Maximum Floating Voltage—1000 V peak.

Maximum Resolution—10 nA.

TEMPERATURE

Range— -62 to $+240$ °C.

Resolution—0.1°C.

Accuracy*1

Temperature to be Measured	-62 to +150°C	+150 to +240°C
P6601 and DM 501A calibrated as a pair	± 2 °C	0 to -6 °C
P6601 and instrument not calibrated as a pair	± 4 °C	+2 to -8 °C

*1 18 to 28°C ambient temperature. For 0 to 18°C, 28 to 50°C ambient temperatures, add 1.5°C to above limit in each direction.

OTHER CHARACTERISTICS

Overrange Indication—Blinking display (except on 1000 V dc and 500 V ac ranges).

Measurement Rate—3 1/3/s.

Power Consumption— ≈ 9 VA.

Inputs—Maximum input voltage is 1000 V. The front panel Volts/ Ω , or Low, or mA terminals can be floated to 1000 V peak maximum above ground, the rear input only 200 V peak. For the rear input, ac volts, ohms, and maximum input specifications are derated.

ORDERING INFORMATION

DM 501A Digital Multimeter \$925
Includes: One pair of test leads (003-0120-00); P6601 Temperature Probe (010-6601-01); Instruction manual (070-2749-00).

OPTION

Option 02—Deletes P6601 Temperature Probe and temperature-measurement capability. — \$80

DMM OPTIONAL ACCESSORIES

The following accessories may be ordered as options for use with any of the three TM 500/TM 5000 Digital Multimeters.

Test Leads—
(Black) 4 ft. Order 012-0425-00 \$13.25
(Red) 4 ft. Order 012-0426-00 \$24
(Black) 4 ft. Order 012-0426-01 \$24

Test Lead Set—Includes 012-0425-00, 012-0426-00, and 013-0107-05. Order 012-0427-00 (DM 5120/5520 only) \$30
Order 012-0941-02.*1

Temperature Probes—P6601 (DM 501A and DM 502A only) \$250
P6602 (DM 504A only) \$260

Adapter—Female-BNC-to-Dual-Banana. Order 103-0090-00. \$10

High-Voltage Probe—(DM 501A, DM 502A, DM 504A only) Order 010-0277-00. \$185

Cables—No specification changes. (1 meter) Order 175-1661-00. \$29
(3 meter) Order 175-1661-02. \$33

Kelvin Clip Lead Set—Order 012-1296-00.*1

*1 Contact your local sales office.