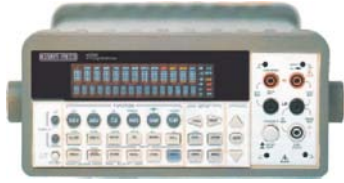




6½ Digit TRMS DIGITAL MULTIMETER



MODEL - M3500A

Model - M3500A - 7 FUNCTIONS 23 RANGES

Model - M3510A - FUNCTIONS RANGES

Model - M3511A - FUNCTIONS RANGES

SPECIAL FEATURES:

- SPEED
- STABILITY
- ACCURACY
- NOISE IMMUNITY



MODEL - M3510A

FEATURES:

- Delivers 50 triggered RDGS/sec via remote interface
- Period & Diode measurement.
- Thermocouple Temperature & RTD measurements.
- Full math functions – dB, dBm, MX+B, ratio, %, Max/Min, null & limits.
- Optional multipoint scanner card – For internal scanning, options include M3500-opt01, a 10-channel, general-purpose card. (Model - M3500A)
- Through Microsoft Office Word & Excel for remotely storing and recalling the measured values.
- Calibration Certificate Available.
- Continuity measurement for resistance.
- Through M3500 AP software for simulating the real operation on PC.
- High noise immunity capability. (Model - M3500A)
- Rack-mounted capability.
- Thermocouple / RTD Measurement (Model M3500A / M3510A)
- Dual displays & Dual measurements. (M3510A / M3511A)
- Capacitance Measurements (M3510A / M3511A).
- Wide range current measurement (max. 10A)(M3510A / M3511A)
- RTD Measurement (Model M3511A).
- Self Test & Manual Calibration (Model M3510A / M3511A)



MODEL - M3511A

GENERAL SPECIFICATIONS :

- * **Sensing** : True RMS Sensing.
- * **High Accuracy** : (Model M3500A) :
DC Voltage : ± 0.0035% of reading. AC Voltage : ± 0.06% of reading.
- * **High Accuracy** : (Model M3510A & Model M3511A)
DC Voltage : <0.012% of reading. AC Voltage : ± 0.12% of reading.
- * **Resolution** : 6½ digit 2,00,000 Counts
- * **Display** : 5 x 7 dot matrix VFD, Dual displays with three-color annunciators. (Model M3500A)
LCD Display for (Model M3510A & Model M3511A).
- * **High Speed** : Both sampling rate and data rate are at 2000 readings/sec (at 4½ digit setting). Sampling rate 50K (M3510A), 10K (M3511A) readings/Sec
- * **High Capacity of Internal Data Memory** : It can store up to 2000 readings in data memory
- * **Full-Featured Operations** : There are 11 measurements and 8 math Functions.
- * **Temperature Measurements** : The built-in function supports two measurement methods : Thermocouples and RTDs. For thermocouples, it supports up to 7 types of sensors E, J, K, N, R, S and T.
- * **Data Transfer rate** : 2000 readings/Sec. (M3500A)
- * **Vibration** : MIL-PRF-28800F, 3.84.2. Vibration, Sinusoidal Class 1.2 (Model M3510A & M3511A)
- * **Shock** : Mil-prf-28800f, 4.5.5.4 Mechanical. (Model M3510A & M3511A)
- * **± (% of reading + % of range, 23°C ± 5°C) at 6½ digits with 2-hour warm-up.** (Model M3510A & M3511A)
- * **The specifications are for 2-hour warm-up condition, 10 PLC & they are relative to calibration standards..** (Model M3510A & M3511A)
- * **Model - M3511A doesn't provide the selection of the range 3A.**
- * **Null Function Must be used when the 2W is selected .** (Model M3510A & M3511A)
- * **Measurement over 20% at all ranges is allowable except the ranges 750 ACV, 1000DCV & 3A / 10A.**(Model M3510A & M3511A)
- * **Range 750V is limited to 100KHz.**
- * **Measurement accuracy excluded the error of test leads.** (Model M3510A & M3511A)
- * **Bandwidth** : 3Hz. Specifications are for sine wave input >5% of range. For <50KHz & inputs within 1% to 5% of range, the error 0.3% of range must be added. For inputs within 50KHz to 100KHz, the 0.35% of range must be added. (Model M3510A & M3511A)
- * **Power Line Frequency** : 50/60Hz ± 10%
- * **Power Consumption** : 25VA Max. (16W Average)(M3500A)
25VA Max. (5W Average)(M3510A / M3511A)
- * **Operating Temperature** : 0°C ~ 50°C; 80% R.H. Upto 31°C.
- * **Storage Temperature** : -40°C ~ 70°C
- * **Operating Altitude** : upto 2000M
- * **Power Supply** : 100V/120V/220V/240V±10%
- * **Dimension** : 213.6(W) x 88.6(H) x 370.0(D)mm (Model M3500A)
214.6(W) x 88.6(H) x 280.7(D)mm (Model M3510A / M3511A)
- * **Weight** : approx. 2.23Kg.(M3500A), 2.650kg. (M3500A / M3511A)

SAFETY :

- **Safety** : IEC61010-1 / EN61010-1 / UL61010-1 (M3500A), IEC61010-1:2001 / EN61010-1:2001 2nd ed. Measurement CAT II 600V, CAT I 1000V. (M3510A / M3511A)
- **E.M.C.** : EN61326-2006. EN61326-2-1:2006
- **Pollution Degree** : 2

All Specifications are subject to change without prior notice

ACCESSORIES :

One power line cord, One USB cable, Standard Test Leads, One Software CD & User's manual.

OPTIONAL ACCESSORIES :

MODEL : M3500A

Multi-point(10Channel) Scanner Card No. M3500-opt01, Thermocouple adapter (6 Types) : M3500-opt02E, M3500-opt02J, M3500-opt02K, M3500-opt02N, M3500-opt02RS, M3500-opt02T. Adapters (Banana to BNC Adapter) No. M3500-opt03, GPIB Card No. M3500-opt04, RTD Probe Adapter No. M3500-opt05, RS232 cord M3500 - opt06, Kelvin Probe M3500-opt07, 4-Wire Test Leads M3500-opt08, Shorting Plug M3500-opt10, & Calibration Certificate Traceable to NPL.

MODEL : M3510A / M3511A

GPIB Card No. M3500-opt04, RS232 cord M3500 - opt06, Kelvin Probe M3500-opt07, 4-Wire Test Leads M3500-opt08, Shorting Plug M3500-opt10, K-type Thermocouple cable M3500-opt11 (only for Model-M3510A)

* **PC Applications :** We provide Matlab® and Lab View® applications that allows user to do a variety of tasks. Also feature the PT-Tool that can acquire data directly from the measurement into MS Word® or Excel®. Even without MS Word® or Excel®, user can choose our PT-Link, which is a stand-alone application. Remote Interface : USB and GPIB (optional).

ELECTRICAL SPECIFICATIONS : M3500A

DC VOLTAGE

Function	Range	Input Resistance	1 Year Accuracy : ± (% of reading + % of range) (23°C ± 1°C)
DCV (DC Voltage)	100.0000 mV	> 10G	0.0050 + 0.0035
	1.000000 V	> 10G	0.0040 + 0.0007
	10.000000 V	> 10G	0.0035 + 0.0005
	100.0000 V	10 M	0.0045 + 0.0006
	1000.000 V	10 M	0.0045 + 0.0010

DC CURRENT

Function	Range	Shunt Resistance	1 Year Accuracy : ± (% of reading + % of range) (23°C ± 1°C)
DCA (DC Current)	10.00000 mA	5.1	0.050 + 0.020
	100.0000 mA	5.1	0.050 + 0.005
	1.000000 A	0.1	0.100 + 0.010
	3.000000 A	0.1	0.120 + 0.020

RESISTANCE

Function	Range	Test Current	1 Year Accuracy : ± (% of reading + % of range) (23°C ± 1°C)
Resistance (Specifications are for 4W or 2W when a NULL operation is used).	100.0000	1 mA	0.010 + 0.004
	1.000000 K	1 mA	0.010 + 0.001
	10.000000 K	100 A	0.010 + 0.001
	100.0000 K	10 A	0.010 + 0.001
	1.000000 M	5 A	0.010 + 0.001
	10.00000 M	500 nA	0.040 + 0.001
	100.0000 M	500 nA/ 10 M	0.800 + 0.010
Diode Test	1.00000 V	1 mA	0.010 + 0.020
Continuity	1000.00	1 mA	0.010 + 0.030

FREQUENCY AND PERIOD

Function	Range	Frequency (Hz)	1 Year Accuracy : ± (% of reading) (23°C ± 1°C)
Frequency & Period	100 mV to 750 V	3 - 5	0.10
		5 - 10	0.05
		10 - 40	0.03
		40 - 300K	0.01

AC CHARACTERISTICS

Function	Range	Frequency (Hz)	1 Year Accuracy : ± (% of reading + % of range) (23°C ± 1°C)
ACV (AC TRMS Voltage)	100.0000 mV	3 - 5	1.00 + 0.04
		5 - 10	0.35 + 0.04
		10 - 20 K	0.06 + 0.04
		20K - 50 K	0.12 + 0.05
		50K - 100K	0.60 + 0.08
		100K - 300K	4.00 + 0.50
	1.000000 V to 750.000V	3 - 5	1.00 + 0.03
		5 - 10	0.35 + 0.03
		10 - 20 K	0.06 + 0.03
		20K - 50 K	0.12 + 0.05
50K - 100K		0.60 + 0.08	
	100K - 300K	4.00 + 0.50	
ACA (AC TRMS Current)	1.000000 A	3 - 5	1.00 + 0.04
		5 - 10	0.30 + 0.04
		10 - 5 K	0.10 + 0.04
	3.000000 A	3 - 5	1.10 + 0.06
		5 - 10	0.35 + 0.06
		10 - 5 K	0.15 + 0.06

Note 1 : Specifications are for 1-hour warm-up at 6.5 digits, slow ac filter with Bandwidth 3Hz, sine wave input.

Note 2 : 750 Vac range limited to 100kHz

TEMPERATURE

Sensor Type	Temperature Range (Degree C)	Temperature (Degree F)
E	-270 ~ 1000	-518 ~ 1832
J	-210 ~ 1200	-140 ~ 2192
K	-270 ~ 1372	-518 ~ 2502
N	-270 ~ 1300	-518 ~ 2372
R	-50 ~ 1768	-122 ~ 3236
S	-50 ~ 1768	-122 ~ 3236
T	-270 ~ 400	-518 ~ 752
RTD (PT-100)	-200 ~ 850	-392 ~ 1562

All specifications are subject to change without prior notice.

ELECTRICAL SPECIFICATIONS : KM 3510A/3511A

DC CHARACTERISTICS

Function	Range	Resistance	1 Year Accuracy :
DCV	100.0000 mV	0.1 μ V	0.0080+0.0045
	1.000000 V	1.0 μ V	0.0090+0.0010
	10.00000 V	10 μ V	0.0120+0.0020
	100.0000 V	100 μ V	0.0120+0.0020
	1000.000 V	1 mV	0.0130+0.0030
DCI	10.00000 mA	10 nA	0.050+0.020
	100.0000 mA	100 nA	0.050+0.010
	1.0000000 A	1 μ A	0.150+0.020
	3.00000 A	10 μ A	0.200+0.030
	10.00000 A	10 μ A	0.250+0.050
W W	100.0000	100 μ	0.020+0.005
	1.000000 K	m	0.020+0.002
	10.00000 K	10 m	0.020+0.002
	100.0000 K	100 M	0.020+0.002
	1.000000 M	1	0.020+0.004
	10.00000 M	10	0.100+0.004
	100.0000 M	100	1.500+0.005
	1000.0000 M	1000	15.000+0.005
DIODE	1.00000 V	10 μ V	0.020+0.020
CONTINUITY (for 2 W)	10000.00	10 m	0.020+0.030

AC CHARACTERISTICS

Function	Range	Resolution	Frequency (Hz)	1 Year Accuracy
ACV (TRMS)	100.0000 mV	0.1 μ V	10K - 20K	0.12 + 0.05
			20K - 50K	0.25 + 0.05
			50K - 100K	0.65 + 0.08
			100K -300K	4.50 +0.50
	1.000000 V to 750.0000 V	1.0 μ V to 1mV	10K - 20K	0.12 + 0.04
			20K - 50K	0.25 + 0.05
			50K - 100K	0.65 + 0.08
			100K -300K	4.50 +0.50
ACI (TRMS)	1.000000 A 3.000000 A 10.000000 A	1 μ A 10 μ A 10 μ A	10K - 5K	0.20 +0.04
			10K - 5K	0.30 +0.06
			10K - 5K	0.50 + 0.12

FREQUENCY % PERIOD

Function	Range	Frequency	1 Year Accuracy
Ferquency & Period	100mV~750V	10 - 40 40 - 300k	0.03 0.02

TEMPERATURE CHARACTERISTICS

Function	Type	Range	1 Year Accuracy
THERMO- COUPLE	B	600°C ~ 1820 °C	1.5°C
	C	0°C ~ 2316 °C	1.5°C
	E	-250°C ~ 1000°C	1.5°C
	J	-210°C ~ 1200°C	1.0°C
	K	-200°C ~ 1372° C	1.0°C
	N	-200°C ~ 1300°C	1.0°C
	R	0°C ~ 1767°C	1.5°C
	S	0°C ~ 1767°C	1.5°C
T	-250°C ~ 400°C	1.5°C	

CAPACITANCE

Function	Range	Test current	1 Year Accuracy
CAPACI- TANCE	1 nF	10 μ A	2.0 + 0.80
	10 nF	10 μ A	1.0 + 0.50
	100 nF	100 μ A	1.0 + 0.50
	1 μ F	100 μ A	1.0 + 0.50
	10 μ F	100 μ A	1.0 + 0.50
	100 μ F	1 mA	1.0 + 0.05
	1000 μ F	1 mA	1.0 + 0.50
	10000 μ F	1 mA	2.0 + 0.50

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MODEL - M3500A / M3510A / M3511A COMPARISON SHEET

FUNCTION	MODEL	M3500A	M3510A	M3511A
Digits	6 ½	6 ½	6 ½	6 ½
Display	VFD	VFD	LCD	LCD
True RMS	YES	YES	YES	YES
Basic Functions (DCV/DCI, ACV/ACI, 2W/4W, CONT/DIODE, RTD, LIMITS, MX+B,% dBm, dB, Min/max & null)	YES	YES	YES	YES
DCV Accuracy (1Year)	0.0035%	<0.012%	<0.012%	<0.012%
Sensitivity	DCV :0.1µV 2W / 4W µ	DCV :0.1µV 2W / 4W µ	DCV :0.1µV 2W / 4W µ	DCV :0.1µV 2W / 4W µ
AC Measurement Range	3Hz to 300 KHz	10Hz to 300 KHz	10Hz to 300 KHz	10Hz to 300 KHz
Dual Measurement	NO	YES	YES	YES
Sampling Rate	2000 Rdgs / s	50K Rdgs / s	10K Rdgs / s	10K Rdgs / s
Thermocouple Measurement	YES (Indirect)	YES (Direct)	NO	NO
Capacitance Measurement	NO	YES	YES	YES
Maximum Current Measurement Capability	3A	10A	10A	10A
Support Scanner Card Measurement	YES	NO	NO	NO
Rear Terminal	YES	YES	YES	YES
Compliant SCPI	YES	YES	YES	YES
CE Approved	YES	YES	YES	YES
USBTMC	YES	YES	YES	YES
Free Software	YES	YES	YES	YES
GPIB / RS - 232	Support	Support	Support	Support

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