

## Product Information

The M3510A 6 1/2 Digit Multimeter is the newest generation of DMM from Picotest. This new DMM offers compact size, light weight, fast measurement speed & throughput, expanded measurement functions, systematization capability and a highly usable interface including a standard USB interface and a GPIB/RS-232 interface. The M3510A DMM is suitable for both production and research/development use.

### KEY FEATURES:

- 6 1/2 Digits High-Performance DMM
- High Speed: 50K RDGS/S
- Dual Measurements & Displays
- Temperature Measurements
- Multi-Measurement & Math Functions
- True RMS
- Easy-to-Use MENU
- Built-in USB Interface & USBTMC Conformance
- Quality Assurance
- Free Application Software

## Detailed Specifications

### 6 1/2 Digits High-Performance DMM

The M3510A 6 1/2 Digits Multimeter is the newest generation of DMM from Picotest. This new DMM offers a compact size, light weight, fast measurement speed & throughput, expanded measurement functions, systematization capability and highly usable interfaces including a standard USB interface and a GPIB/RS-232 interface. The M3510A DMM is suitable for both production and research/development use.

### 50000 Readings/Sec Sampling Rate

M3510A adopts the latest A/D technology and achieve 50,000 readings per second at 4 1/2 digits. When sending data to your computer, M3510A can achieve high precision and stability compared to other DMMs with slow data transmission rate. With M3510A, your work efficiency will be greatly improved, and the operational cost will also be greatly reduced.

### Dual Measurements & Displays

The dual measurement display feature of M3510A offers two measurement results displayed at the same time and it is easy to set up and configure. For example, when measuring DCV, you may also conduct Thermocouple measurement on M3510A. This allows you to observe temperature change while making other measurements. M3510A can function as a multimeter and a thermometer in one.

## **Temperature Measurements**

The M3510A DMM supports the RTD temperature measurement and supports the standards such as ITS-90, IEC751 and Callendar-Van Dusen. The RTD function is recommended for more precise measurement. M3510A also provides the Thermocouple (TC) function. It has a built-in cold junction compensator for improved TC accuracy. Without additional plug-in's and reference temperature settings, you can measure temperature directly via Thermocouples of K, J, R, S, T, E, N, C and B types.

## **Multi-Measurement & Math Functions**

The M3510A DMM offers the capacitance measurement and dual measurement display, in addition to standard measurements, such as DCV, DCI, ACV, ACI,  $2W\Omega$ ,  $4W\Omega$ , Frequency, Period, Thermocouple & RTD, and the math functions, such as Limits, Ratio, MX+B, %, dBm, dB, Min/Max & Null. Measurement ranges have also been expanded. For instance, DC and AC Current Ranges now go up to 10 A.

## **True RMS**

The M3510A DMM adopts an analog conversion technique to provide true RMS value for ACV/ACI measurements regardless of the waveform shape. Only the “heating value” of the AC components of the input waveform is measured. For non-symmetrical waveforms, such as pulse trains, the DC components will be rejected by the RMS measurement.

## **Simple to Use**

Configuring the M3510A is straightforward. Unlike other DMMs with complicated operation modes in the configuration menu, M3510A offers easy-to-use SHIFT, CONFIG, ENTER buttons, arrow keys and corresponding soft keys at the lower part of the display across all the measurement configurations. Using equipments from Picotest just gets easier than ever.

## **Built-in USB Interface & USBTMC Conformance**

A high-speed USB interface is built into the M3510A. A GPIB/RS-232 interface is also included. The included USB interface conforms to the USBTMC protocol. The M3510A and can be operated through USBTMC compliant software. So get the M3510A now to replace your old DMMs while keep your existing USBTMC compliant software.

## **Reliability**

The M3510A DMM is of high reliability and complies with CE requirements, from well-packed cartons with the shock absorbing bumpers to careful component selection, circuit protection design, rigorous environmental tests and ISO9001 production. Defective products can be returned with free repair/calibration with one-year warranty.

## **A Sample Application (Current vs. Temperature)**

The M3510A DMM is shipped with the PT-TOOL & PT-LINK software. With the software, you can quickly establish an error-free connection between your PC and the equipment. The M3510A conforms to Standard Commands for Programmable Instrumentation (SCPI). PT-TOOL is a virtual oscilloscope software, which can monitor the DUT with scope display style. PT-LINK is used to collect measurement data in Microsoft Excel or Word and analyze it with charts. In addition, engineers are allowed to compile our Labview Driver for specific applications.

## **Dimension Information**

If problem occurs while operating M3510A, it is recommended to do the self-test first. If you need to perform basic adjustments for Zero & Gain, please follow the instructions in the M3510A Service Manual. A calibrator with at least 6 1/2-digit precision and a shorting plug are required. For a complete calibration with factory reports, contact your local service representative to return your DMM to PICOTEST.

## **Accessories**

CD (user manual and software applications), power cord, test leads, and USB cable.  
GPIB Interface Card  
3 Year Warranty

The following options are available:

1. M3500-opt04: GPIB Card (now comes standard)
2. M3500-opt06: RS-232 Card
3. M3500-opt07: Kelvin Probe
4. M3500-opt08: 4-Wire Test Leads
5. M3500-opt10: Shorting Plug
6. M3500-opt11: K Type Thermocouple Probe

## Specifications

DC Characteristics					
Function	Range	Resolution	1 Year Accuracy <sup>2</sup>		
DC Voltage	100.0000 mV	0.1 $\mu$ V	0.0080+0.0045		
	1.000000 V	1.0 $\mu$ V	0.0090+0.0010		
	10.00000 V	10.0 $\mu$ V	0.0120+0.0020		
	100.0000 V	100.0 $\mu$ V	0.0120+0.0020		
DCI	1000.000 V	1 mV	0.0130+0.0030		
	10.00000 mA	10 nA	0.050+0.020		
	100.0000 mA	100 nA	0.050+0.010		
	1.000000 A	1 $\mu$ A	0.150+0.020		
2W $\Omega^3$ /4W $\Omega$	3.00000 A	10 $\mu$ A	0.20+0.030		
	10.00000 A	10 $\mu$ A	0.250+0.050		
	100.0000 $\Omega$	100 $\mu\Omega$	0.020+0.005		
	1.000000 K $\Omega$	1 m $\Omega$	0.020+0.002		
	10.00000 K $\Omega$	10 m $\Omega$	0.020+0.002		
	100.0000 K $\Omega$	100 m $\Omega$	0.020+0.002		
	1.000000 M $\Omega$	1 $\Omega$	0.020+0.004		
DIODE	10.00000 M $\Omega$	10 $\Omega$	0.100+0.004		
	100.0000 M $\Omega$	100 $\Omega$	1.500+0.005		
CONTINUITY (for 2W $\Omega$ )	1.00000 V	10 $\mu$ V	0.020+0.020		
	1000.00 $\Omega$	10 m $\Omega$	0.020+0.030		
FREQUENCY & PERIOD					
Function	Range	Frequency (Hz)	1 Year Accuracy <sup>2</sup>		
Frequency & Period	100 mV to 750 V <sup>4</sup>	10-40	0.03		
		40-300K	0.02		
AC CHARACTERISTICS					
Function	Range	Resolution	Frequency (Hz)	1 Year Accuracy <sup>2</sup>	
ACV (TRMS)	100.0000 mV	0.1 $\mu$ V	10-20K	0.1200 +0.050	
			20K-50K	0.2500+0.050	
	50K-100K		0.6500+0.080		
	100K-300K		4.5000+0.500		
	1.000000 V to 750.0000 V <sup>4</sup>	1.0 $\mu$ V to 1 mV	10-20K	0.1200+0.040	
			20K-50K	0.2500+0.050	
50K-100K			0.6500 +0.080		
100K-300K			4.5000+0.500		
ACI (TRMS)	1.000000 A	1 $\mu$ A	10-1K	0.20+0.04	
	3.00000 A	10 $\mu$ A	1K-5K	1.00+0.10	
			10-1K	0.30 +0.06	
	10.00000 A	10 $\mu$ A	1K-5K	1.50+0.15	
			10-1K	0.50+0.10	
				1K-5K	2.0+0.20
CAPACITANCE CHARACTERISTICS					
Function	Range	Test Current	1 Year Accuracy <sup>2</sup>		
CAPACITANCE <sup>5</sup>	1 nF	10 $\mu$ A	2.0+0.80		
	10 nF	10 $\mu$ A	1.0+0.50		
	100 nF	100 $\mu$ A	1.0+0.50		
	1 $\mu$ F	100 $\mu$ A	1.0+0.50		
	10 $\mu$ F	100 $\mu$ A	1.0+0.50		
	100 $\mu$ F	1 mA	1.0+0.50		
	1000 $\mu$ F	1 mA	1.0+0.50		
	10000 $\mu$ F	1 mA	2.0+0.50		
	TEMPERATURE CHARACTERISTICS				
	Function	Type	Range	1 Year Accuracy <sup>2</sup>	
THERMOCOUPLE <sup>6</sup>	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		

## General Specifications

Item	Limitation & description
Power Supply	100V/120V/220V/240V $\pm$ 10%
Power Line Frequency	50/60 Hz $\pm$ 10%
Power Consumption	25 VA peak (5 W AVERAGE)
Operating Temperature	0 °C to 50 °C
Operating Humidity	Maximum relative humidity 80% for temperature up to 31 °C
Storage Temperature	- 40 °C to 70 °C
Operating Altitude	Up to 2000 M
Bench Dimensions (WxHxD)	214.6x88.6x280.7mm
Weight	2.23 KG
Safety <sup>7</sup>	IEC61010-1:2001/EN61010-1:2001 (2nd Edition) Measurement CAT II 600V, CAT I 1000V Pollution Degree 2
EMC	EN61326-1:2006, EN61326-2-1:2006
VIBRATION	MIL-PRF-28800F, 3.8.4.2 VIBRATION, SINUSOIDAL CLASS 1,2
SHOCK	MIL-PFR-28800F, 4.5.5.4 MECHANICAL
Warranty	One Year

<sup>1</sup>The specifications are under 2-hour warm-up condition with the setting 10 PLC, and they're relative to the calibrator specifications in PICOTEST.

<sup>2</sup>  $\pm$  (% of reading + % of range), (23 °C  $\pm$  5 °C)

<sup>3</sup>The Null function must be used when the 2W $\Omega$  is adopted.

<sup>4</sup> The Range 750 V is limited to 100 KHz.

<sup>5</sup> The Null function must be used.

<sup>6</sup> The measured value must be plus the error of test leads.

<sup>7</sup> The LO jack is marked with 500Vpk against ground and SENSE HI to LO is only marked with 200Vpk, in opposition to the label of 600V CAT II and/or 1000V CAT I against ground and IEC 61010-1.

Specifications are subject to change without notice.

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