Test Equipment s.r.l., commercial partner of Picotest Corporation proudly present the new generation of measurement instruments.

- compact

- high performances

- cheap

- reliable

PICOTEST®

M3500A
Digital Multimeter 6½ digits

PICOTEST®

G5100A
*Arbitrary Function generator
up to 50 MHz*

Test s.r.l., official distributor in Italy on behalf of Picotest Corporation introduces a new set of measuring instruments in low/medium cost segment of the measurement equipment market.

Many manufacturers of the Asian market drive their R&D departments with the only aim to reduce overall costs.

Often, the only result of this commercial strategy is selling measurement equipment with very low quality, performance and maintenance.

Picotest Corporation, in sharp contrast to this strategy, has decided to sell each type of measurement instruments only after careful planning and design.

This make it possible to market measuring instruments with high quality, cost and performance comparable or higher than to the products of most emblazoned manufacturers, making possible to save a lot of money during purchasing and in case of servicing.

Furthermore, Test s.r.l., as a trading partner of Picotest, and under its laboratory, offers an high quality, low cost after sales service which includes, reconditioning, repair, and calibration service.

Main features description

M3500A – Digital Multimeter 6 ½ digits

- Support USBTMC
- High Stability, Speed and Accuracy
- Up to 2000 readings/sec
- Optional 10-channels multi point scanner card
- 19 Full-Featured Functions
- Temperature Measurements with RDT and thermocouples sensors
- Dual 5x7 dot matrix Displays with 3-Color Enunciators
- High Noise immunity.
- Built-in USB Interface (opt. RS232 & opt. GPIB interface available).
- Free Remote-Control Software
- Many accessories available.

G5100A - Arbitrary Function generator up to 50 MHz

- 50 MHz Sine, 25 MHz Square & 10 MHz arbitrary Waveforms
- 14-bit, 125 MSa/s, 256 K-point Arbitrary Waveform
- Pulse, Ramp, Triangle, Noise & DC Waveforms
- Linear & Logarithmic Sweeps & Burst Operation
- AM, FM, PM (PSK), FSK & PWM Modulation Types
- Amplitude Range, 20 mVpp to 20 Vpp into Open Circuit
- Remote Control via USB, LAN or Opt. GPIB
- Graph mode for visual verification of signal settings
- 16-bit Data Output via Pattern Out
- Free Waveform Editor Software Wavepatt®

M3500A – general features description

M3500A is a 6½ digit digital multimeter. It has 0.0015% 24-hour basic DC voltage accuracy at 10V range and 0.002% 24-hour basic resistance accuracy at 10kΩ range. At 6½ digit, the multimeter delivers 50 triggered RDGS/sec via remote interface. At the fast 4½ digit, it reads over 2000 RDGS/sec into its internal buffer.

Note: The 24-hour measurement is subject to calibration accuracy.

M3500A provides wide measurement ranges:

- DC voltage: 0.1V, 1V, 10V, 100V & 1000V.
- AC voltage: 0.1V, 1V, 10V, 100V & 750V.
- DC current: 10mA, 100mA, 1A & 3A.
- AC current: 1A & 3A.
- 2 & 4-wire resistance: 100Ω, 1KΩ, 10KΩ, 100KΩ, 1MΩ, 10MΩ & 100MΩ.
- Frequency: From 3Hz to 300kHz.
- Period measurement.
- Diode & Continuity test.
- Diode measurement.
- Continuity measurement for resistance.
- Thermocouple temperature & RTD measurements.

Some additional capabilities of M3500A include:

- 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.
- USB and GPIB (M3500-opt04) remote control interface.
- Through Microsoft Office Word & Excel for remotely storing and recalling the measured values.
- Through M3500 AP software for simulating the real operation on PC.

M3500A supports USBTMC, so you don't have to buy any expensive GPIB module, and waste time to re-program the previous application software which is for GPIB.

Before using USBTMC, please click into NI website (http://www.ni.com/visa) to download NI driver.

After setting up M3500A application software, PT-TOOL & PT-LINK (enclosed in the CD), or your own programs, the M3500A will be controlled easily.

M3500A front panel description
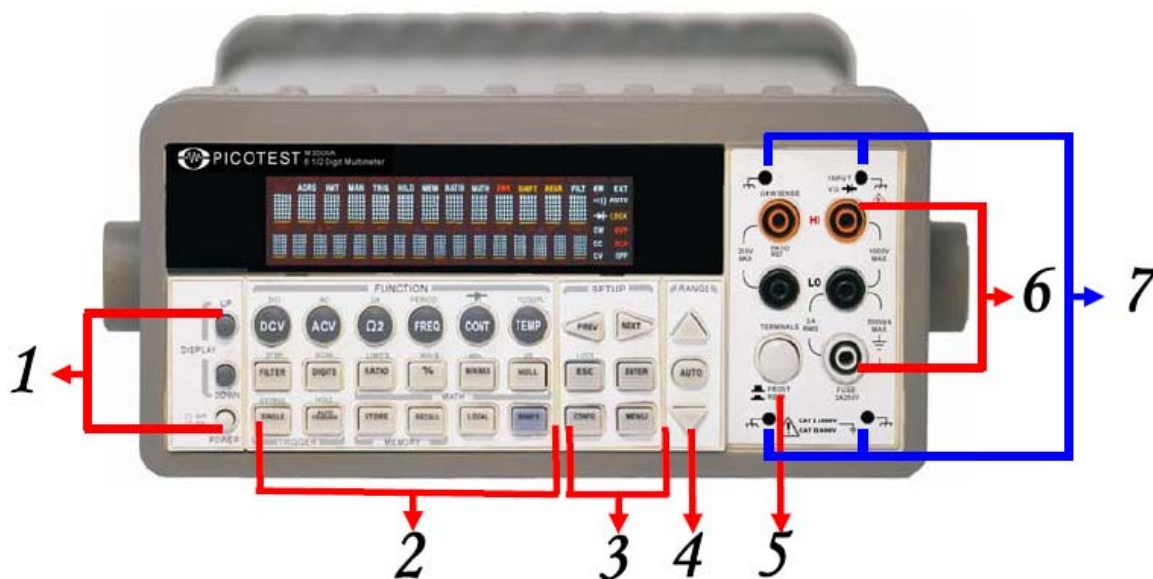
There are different buttons and terminals on the front panel. They are divided into the following groups: (DISPLAY & POWER), (FUNCTION, MATH, TRIGGER, MEMORY, SETUP, RANGE, INPUT TERMINALS), and (FILTER, DIGITS, LOCAL, and SHIFT) as shown in the previous figure

1. Power & Display

- Power: Activates M3500A DMM
- Display: Shows model, version & condition by pressing round PREV & NEXT buttons.

2.1. First row without SHIFT button

- DCV: Selects DC voltage measurement.
- ACV: Selects AC voltage measurement.
- Ω2: Selects 2-wire resistance measurement.
- FREQ: Selects frequency measurement.
- CONT: Selects the continuity test.
- TEMP: Selects RTD temperature measurement.

2.2. First row with SHIFT button

- DCI: Selects DC current measurement.
- ACI: Selects AC current measurement.
- Ω4: Selects 4-wire resistance measurement.
- PERIOD: Selects period measurement
- ⟶⊦: Selects diode testing
- TCOUPL: Selects thermocouple temperature measurement.

2.3. Second row without SHIFT button

- FILTER: Enable or disable the digital filter.
- DIGITS: Changes resolution.
- RATIO: Enables the dcv:dcv ratio function.

- %: Calculates the ratio to a target value in percentage.
- MIN/MAX: Captures the minimum or maximum readings from the measurement
- NULL: Activates the offset function in order to get the real measured reading

2.4. Second row with SHIFT button

- STEP: Scans from a channel to the next channel in delayed action when using the scanner card.
- SCAN: Enables scanning function when using the scanner card
- LIMITS: Used for Setting upper and lower limit values for readings.
- MX+B: Used for calculating slope. X is the normal display reading. M and B are constants specified by user for scale factor and offset.
- dBm: Used for displaying voltage measurement in dBm power unit.
- dB: Used for displaying voltage measurement in decibel unit.

2.5. Third row without SHIFT button

- SINGLE: Manually triggers the multimeter to make measurements.
- AUTO TRIGGER: Instructs the multimeter to make measurements continuously.
- STORE: Stores a specified number of subsequent readings.
- RECALL: Displays stored readings and buffer statistics. Use ◁ ▷ or △ ▽ searching buttons to toggle between reading number and reading.
- LOCAL: Cancels USB or GPIB remote mode.
- SHIFT (in blue): Used for accompanying other button with upper print in blue and converting function.

2.6. Third row with SHIFT button

- EXTRIG: Selects external triggers as the trigger source via BNC port on the rear panel.
- HOLD: Holds reading.

3.1. First row in SETUP section

- ◁ ▷ Scrolls through buffer, conceals or reveals the digits while measuring.

3.2. Second row in SETUP section

- ESC: Cancels selection, moving back to measurement display.
- ENTER: Accepts selection, moving to next choice or back to measurement display.
- LOCK: Presses SHIFT then ESC button to prevent unpredictable operation on the panel. In order to release lock condition, please press ESC again.

3.3. Third row in SETUP section

- CONFIG: Offers setting or adjusting function, relating some front panel buttons.
- MENU: Offers setting or adjusting function, not relating other front panel buttons.

4. Range

- △ ▽ Mover to higher or lower range
- AUTO: Enables or disables auto-range

5. Terminals

Selects input signal connections on front or rear panel.

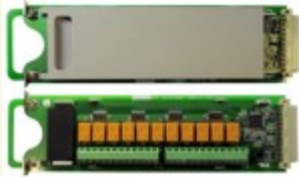## 6. Inserted Connections & Fuse Device

- 4 Chassis Ground Connections: Separate environmental noises.
- HI & LO: Used for all measurements, except DC and AC current. (Maximum input voltage: 1000V for voltage measurements. 200V for 4-wire measurement)
- LO & I: Used for making DC and AC current measurements.
- Front Fuse: Secures your Meter against damage of strong current pulse. (Maximum current: 3A, 250V)

7. Chassis Ground Terminal

The chassis ground terminal is used for shielding the noise from the nature, especially when users want to get a very small signal via the application of a BNC-to-Banana Adapter

Options Available

1.	M3500-opt01	Multi-Point Scanner Card	
2.	M3500-opt02	Thermo-couples adapter	
3.	M3500-opt03	Banana to BNC adapter	
4.	M3500-opt04	GPIB Card	
5.	M3500-opt05	RTD probe adapter	
6.	M3500-opt06	RS-232 Card	
7.	M3500-opt07	Kelvin Probe	
8.	M3500-opt08	4-wires test leads	

Comparison between 6½ digit Digital Multimeter

Model	Picotest M3500A	Agilent 34401A	Keithley K-2000	Fluke 8845A
List price	690 € (*)	800 €	890 €	1000 €
display	VFD Dot Matrix, Dual Displays with 3 colors	Character based VFD	LCD	VFD Dot Matrix
Speed (6 ½ digit)	59 reading /sec	6 readings/sec	60 readings/sec	6 readings/sec
Speed (5 ½ digit)	545 reading /sec	300 readings/sec	500 readings/sec	300 readings/sec
Speed (4 ½ digit)	2000 reading /sec	1000 readings /sec	2000 readings/sec	>1000 readings/sec
DCV Ranges	100mV~1000V	100mV~1000V	100mV~1000V	100mV~1000V
Accuracy (1 year)	0.0035%+0.0005%	0.0035%+0.0005%	0.0030%+0.0005%	0.0035%+0.0005%
ACV Ranges	100mV~750V	100mV~750V	100mV~750V	100mV~750V
Accuracy (1 year)	0.06%+0.03%	0.06%+0.03%	0.06%+0.03%	0.06%+0.03%
Frequency	3Hz~300KHz	3Hz~300KHz	3Hz~300KHz	3Hz~300KHz
Input Resistance	1MΩ	1MΩ	1MΩ	1MΩ
ADC Ranges	10mA/100mA/1A/3A	10mA/100mA/1A/3A	10mA/100mA/1A/3A	100µA/1mA/10mA/100mA/1A/3A/10A
Accuracy (1 year)	0.05%+0.005%	0.05%+0.005%	0.05%+0.008%	0.05%+0.005%
AAC Ranges	1A/3A	1A/3A	1A/3A	10mA/100mA/1A/3A/10A
Accuracy (1 year)	0.1%+0.04%	0.1%+0.04%	0.15%+0.06%	0.1%+0.04%
Frequenza	3Hz~5KHz	3Hz~5KHz	3Hz~5KHz	3Hz~5KHz
Resistance Ranges	100Ω~100MΩ	100Ω~100MΩ	100Ω~100MΩ	100Ω~100MΩ
Accuracy (1 year)	0.01%+0.001%	0.01%+0.001%	0.01%+0.001%	0.01%+0.001%
2 wires/4 wires	YES	YES	YES	YES
Frequency	3Hz~300KHz	3Hz~300KHz	3Hz~500KHz	3Hz~300KHz
Accuracy (1 year)	0.01%	0.01%	0.01%	0.01%
Temperature	TC,RDT	N/A	TC	N/A
Scanner card	10 channels	N/A	10 channels	N/A
Cont./diode Test	YES	YES	YES	YES
Ratio (DCV/DCV)	YES	YES	N/A	N/A
% Math Funct.	YES	N/A	YES	N/A
MX+B Math Funct.	YES	N/A	YES	YES
Digital Filter	YES	N/A	YES	YES
Trigger delay	0~3600s	0~3600s	0~99 hrs	0~3600s
Internal Memory	2000 readings	512 readings	2000 readings	10000 readings
Interface	USB/GPIB(opt) RS-232C(opt)	RS-232C/GPIB	RS-232C/GPIB	RS-232C/IEEE 488.2/LAN

(*) price depends by EUR/USD Exchange rate, actual reference is EUR/USD=1,36 ± 5%

G5100A – general features description

G5100A is an arbitrary function generator which can create stable, precise, clean and low distortion sine waves by using DDS (Direct Digital Synthesis) Technology.

G5100A offers:

- **Standard waveform generation:**

  G5100A can provide 50 MHz Sine, 25 MHz Square & 10 MHz arbitrary Waveforms

- **Arbitrary waveform generation:**

  G5100A has implemented exponential rise and fall, negative ramp, cardiac and sen(x)/x waveform

- **Custom Arbitrary waveform generation:**

  G5100A can generate complex custom waveforms. With 14-bit resolution, and 125 MSa/s sampling rate, the G5100A offers users the flexibility to create waveforms. It also allows users to store up to 5 waveforms, 4 (4 x 256K Points) in nonvolatile memory and 1 in volatile memory.

  Picotest Waveform Editor Software Wavepatt® allows users to create, edit and download complex waveforms.

- **Modulations**

  G5100 can provide external and internal modulations of AM, FM, PM (PSK), FSK & PWM for waveform adjustment.

- **Sweep function**

  G5100 has Built-in linear and logarithmic sweeps from 1ms to 500 s.

- **Burst function**

  G5100A offers the burst operation to generate the selected type of waveform with specified number of cycles.

  Bursts may be triggered internally or manually. Bursts can also be triggered or gated externally by the signal applied to the Ext Trig / FSK / Burst connector on the rear panel.

Signal parameters con be easily set using hotkeys under the main screen or using functions keys.

Signal parameters are described in the main screen or, pressing the Graph button which enables the graph mode they can be viewed the waveform visually in the graph mode and change the waveform parameters by using the knob and the cursor keys.

Finally, G5100A support external reference.

Using "external reference in"/"external reference out" is it possible to synchronize G5100A with every measurement instruments which supports external synchronization.

G5100A front panel description
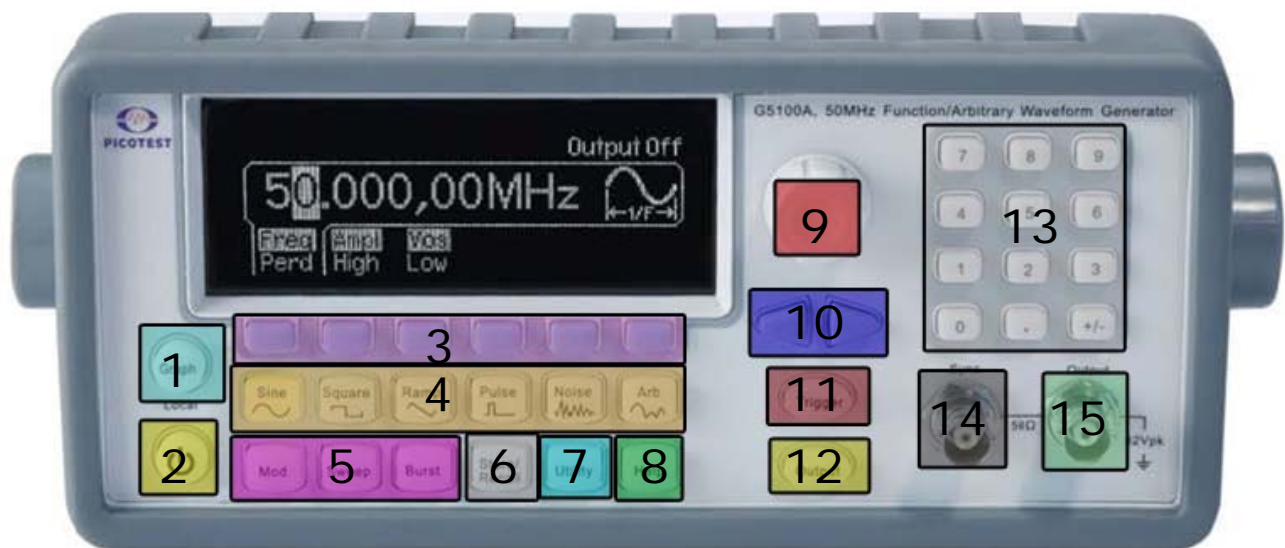
1. Power

2. Graph/Local

3. Menu Operation Softkeys (in color grey)

4. Waveform selection keys

5. Modulation/Sweep/Burst keys

6. Store/Recall Menu Key

7. Utility Menu Key

8. Help Key

9. Knob

10. Cursor Keys

11. Manual Trigger Key

12. Output Key

13. Numeric Keypad

14. Sync output Connector

15. Main signal output Connector

Comparison between arbitrary function generators

Model		Picotest G5100A	Agilent 33220A	Tektronix AFG3021
Price		**950 € (*)**	1400 €	1800 €
display		Dot matrix with graph mode	Dot matrix with graph mode	monochromatic TFT 5.6'' Display
Standard waveforms		Sinusoidal, square, impulse, ramp, triangular, noise, DC	Sinusoidal, square, impulse, ramp, triangular, noise, DC	Sinusoidal, square, impulse, ramp, triangular, noise, DC
Arbitrary waveform		Rise and fall exp, negative ramp, sen(x)/x, cardiac	Rise and fall exp, negative ramp, sen(x)/x, cardiac	Gaussian, Lorentz, Haversine
Sinusoidal	**frequency**	**DC to 20 KHz**	DC to 20 KHz	1 mHz – 25 MHz
	flatness	0,1 dB (<100 KHz) 0,15 dB (<5 MHz) 0,3 dB (<20 MHz) 0,5 dB (<50 MHz)	0,1 dB (<100 KHz) 0,15 dB (<5 MHz) 0,3 dB (<20 MHz)	0,15 dB (<5 MHz) 0,3 dB (<20 MHz) 0,5 dB (fino a 25 MHz)
	THD	THD + N <= 0,06%	THD + N <= 0,04%	< 0,2% (1Vpp, f<20kHz)
Square	**frequency**	**1 µHz – 25 MHz**	1 µHz – 20 MHz	1 mHz to 12.5 MHz
	Rise time	**< 10ns**	< 13ns	<18 ns
	Jitter	**200ps**	1ns + 100ppm of period	/
Tri & Ramp	**frequency**	**1 µHz – 200 KHz**	1 µHz – 200 KHz	1mHz – 250 KHz
Impulse	**frequency**	**500 µHz – 10 MHz**	500 µHz – 5 MHz	1 mHz – 12,5 MHz
Noise	**Bandwidth**	10MHz	9 MHz	25MHz
Arbitrary Wav.	**frequency**	1 µHz – 10 MHz	1 µHz – 6 MHz	1 mHz to 12.5 MHz
	lenght (kpoints)	**2-256**	2-64	2-64
	Resolution	14 bit	14 bit	14 bit
	Sampling	125MSa/sec	50MSa/sec	250Ms/sec
	Rise time	**30 ns**	35ns	/
Modulation		AM: 1mHz-20kHz Depth 0%-120%	AM: 2mHz-20kHz Depth 0%-120%	AM: 2mHz-50kHz Depth 0%-120%
		FM: 2mHz-20kHz Deviation: DC to 25MHz	FM: 2mHz-20kHz – Deviation: DC to 10MHz	FM: 2mHz-20kHz – Deviation: DC to 12.5 MHz 8 (Sinusoidal)
		PM: 2 mHz-20kHz Deviation: 0°-360°	PM: 2 mHz-20kHz Deviation: 0°-360°	PM: 2 mHz-20kHz Deviation: 0°-360°
		PWM: 2 mHz-20kHz 0%-100% imp. length	PWM: 2 mHz-20kHz 0%-100% imp. length	PWM: 2 mHz-50kHz 0%-50% imp. length
		FSK: 2 mHz-100kHz 50% duty cycle	FSK: 2 mHz-100kHz 50% duty cycle	FSK: 2 mHz-50kHz 50% duty cycle
Sweep		Lin, Logarithmic 1ms – 500s	Lin, Logarithmic 1ms – 500s	Lin, Logarithmic 10ms – 100s
Burst		Counted (1-50000 cycles), infinite, gated, triggered	Counted (1-50000 cycles), infinite, gated	Counted (1-1000000 cycles), infinite, gated, triggered

(*) price depends by EUR/USD Exchange rate, actual reference is EUR/USD=1,25 ± 5%

Warranty Information

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

1. Warranty: PICOTEST CORP. guarantees that this product meets its published specifications at the time of shipment from the factory. Under proper installation it should work as expected.

2. Warranty Period: This equipment is warranted against defects in material and manufacturing for a period of one year from the date of shipment. During the warranty period, PICOTEST is responsible for necessary repairs as long as the product can be proved to be defective. For warranty service or repair this product must be returned to a service facility designated by PICOTEST. Please contact your local service representative.

3. Excluded Items: This warranty does not include consumptive parts such as fuses, buttons and relays. Neither does this warranty cover defects caused by improper installation, improper or insufficient maintenance, unauthorized modification, improper operation, ignorance of environmental specifications or improper software or interfacing.

4. Remarks: No other warranty is expressed or implied, except for the above mentioned. The remedies provided herein are the buyer's sole and exclusive remedies. PICOTEST shall not be liable for any direct, indirect, special, incidental or consequential damages.

Limitation of warranty

1. Our warranties do not cover any damage resulting from unauthorized modification or misuse.

2. Unless mentioned elsewhere in this document, our warranty does not apply to fuses, probes, and problems arising from normal wear or user's failure to follow instructions.

3. Our warranties do not apply on any direct, incidental, special, or consequential damages.

4. The above warranties are exclusive and no other warranty is expressed or implied. PICOTEST disclaims any implied warranties of MERCHANTABILITY, SATISFACTORY QUALITY, and FITNESS for any particular reasons.