



Professional True RMS Industrial Digital Multimeter with oscilloscope functions and TFT color LCD display, providing fast A/D converting sampling time, high accuracy, built-in datalogging and Trend Capture features. It can trace any interrupted problems of the equipments and watch on without any person. It is easy to find and solve the problems of the production equipments, providing Bluetooth technology and logging the data. It makes much more safe measurements with double molded plastic housing design and IP67 waterproof function.

This meter measures AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Frequency (electrical & electronic), Duty Cycle, Diode Test, and Continuity plus Thermocouple Temperature. It can store and recall data. It features a waterproof, rugged design for heavy duty use.



## ET2704

### True RMS Multimeter & Oscilloscope

Per IEC1010 Overvoltage Installation Category

#### OVERVOLTAGE CATEGORY III

Equipment of OVERVOLTAGE CATEGORY III is equipment in fixed installations.

Note – Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.

#### OVERVOLTAGE CATEGORY IV


Equipment of OVERVOLTAGE CATEGORY IV is for use at the origin of the installation.

Note – Examples include electricity meters and primary over-current protection equipment

### Safety Instructions

Input Protection Limits	
Function	Maximum Input
V DC or V AC	1000VDC/AC RMS
mA AC/DC	500mA 1000V fast acting fuse
A AC/DC	10A 1000V fast acting fuse (20A for 30 seconds max every 15 minutes)
Frequency, Resistance, Capacitance, Duty Cycle, Diode Test, Continuity	1000VDC/AC rms
Temperature	1000VDC/AC rms
Surge Protection: 8kV peak per IEC 61010	

### General Specifications

Enclosure	Double molded, waterproof
Shock (Drop Test)	6.5 feet (2 meters)
Diode Test	Test current of 0.9mA maximum, open circuit voltage 3.2V DC typical
Continuity Check	Audible signal will sound if the resistance is less than 25Ω (approx.), test current <0.35mA
PEAK	Captures peaks >1ms
Temperature Sensor	Requires type K thermocouple
Input Impedance	>10MΩ VDC & >9MΩ VAC
AC Response	True RMS
AC True RMS	The term stands for "Root-Mean-Square" which represents the method of calculation of the voltage or current value. Average responding multimeters are calibrated to read correctly only on sine waves and they will read inaccurately on non-sine wave or distorted signals. True rms meters read accurately on either type of signal.
ACV Bandwidth	50Hz to 100000Hz
Crest Factor	<3 at full scale up to 500V, decreasing linearly to <1.5 at 1000V
Display	50,000 count backlit liquid crystal with bargraph
Overrange indication	"OL" is displayed
Auto Power Off	5-30minutes (approximately) with disable feature
Polarity	Automatic (no indication for positive); Minus (-) sign for negative
Measurement Rate	20 times per second
Low Battery Indication	"  +" is displayed if battery voltage drops below operating voltage
Battery	One 7.4V
Fuses	mA, μA ranges; 0.5A/1000V ceramic fast blow A range; 10A/1000V ceramic fast blow
Operating Temperature	5°C to 40°C (41°F to 104°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Operating Humidity	Max 80% up to 31°C (87°F) decreasing linearly to 50% at 40°C (104°F)
Storage Humidity	<80%
Operating Altitude	7000ft. (2000meters) maximum.
Safety	This meter is intended for origin of installation use and protected, against the users, by double insulation per EN61010-1 and IEC61010-1 2nd Edition (2001) to Category IV 600V and Category III 1000V; Pollution Degree 2. The meter also meets UL 61010-1, 2nd Edition (2004), CAN/CSA C22.2 No. 61010-1 2nd Edition (2004), and UL 61010B -2-031, 1st Edition (2003)

### Electrical Specifications

Function	Range	Resolution	Accuracy
DC Voltage	50mV <sup>[1]</sup>	0.001mV	(0.05% + 20)
	500mV <sup>[2]</sup>	0.01mV	(0.025% + 5digits)
	5V	0.0001V	(0.025% + 5digits)
	50V	0.001V	(0.025% + 5digits)
	500V	0.01V	(0.05% + 5digits)
	1000V	0.1V	(0.1% + 5)

[1] Add 10 counts by temperature influence.

[2] Add 4 counts by temperature influence.

Function	Range	Resolution	Accuracy
AC Voltage			50 to 10000Hz
	50mV	0.001mV	50/60Hz(0.3% + 25) <1KHz(0.5% + 25) <5KHz(3% + 25)
	500mV	0.01mV	
	5V	0.0001V	
	50V	0.001V	
	500V	0.01V	
	1000V	0.1V	
	All AC voltage ranges are specified from 5% of range to 100% of range		

Function	Range	Resolution	Accuracy
(AC+DC)			0 to 1000Hz
	50mV	0.001mV	<1KHZ(1% + 25) <10KHZ(3.5% + 25)
	500mV	0.01mV	
	5V	0.0001V <sup>[1]</sup>	
	50V	0.001V	
	500V	0.01V	
	1000V	0.1V	

[1] Add 1% above 5k

Function	Range	Resolution	Accuracy
DC Current	500µA	0.01µA	0.1%+20
	5000µA	0.1µA	
	50mA	0.001mA	
	500mA	0.01mA	0.15%+20
	10A	0.001A	0.3%+20
	(20A: 30 sec max with reduced accuracy)		

Function	Range	Resolution	Accuracy
AC Current			50 to 10000Hz
	500µA	0.01µA	50/60Hz(0.6% + 25) <1KHz(1.5% + 25) <10KHz(3% + 25)
	5000µA	0.1µA	
	50mA	0.001mA	
	500mA	0.01mA	
	10A	0.001A	
(20A: 30 sec max with reduced accuracy)			
All AC current ranges are specified from 5% of range to 100% of range			

Function	Range	Resolution	Accuracy
(AC+DC)			0 to 1000Hz
	500µA	0.01µA	(1.0% + 25)
	5000µA	0.1µA	
	50mA	0.001mA	
	500mA	0.01mA	
	10A	0.001A	
		(1.5% + 40)	

Function	Range	Resolution	Accuracy
AC Voltage (5000+Count)			5K-100K
	50mV	0.001mV	(5.0% + 40)
	500mV	0.01mV	
	5V	0.0001V	
	50V	0.001V	
		(6.0% + 40)	

NOTE: Accuracy is stated at 18 to 28°C (65 to 83°F) and less than 75%RH. AC switch according to the calibration of sine wave. It generally increase ±(2% reading + 2% full scale) if non sine wave in the wave crest less than 3.0.

### Accessories

Carrying Case, Testing Leads, Temperature Probe, Battery, Instruction Manual and Test Certificate.

Function	Range	Resolution	Accuracy
Resistance	50Ω <sup>[1]</sup>	0.001Ω	0.5%+20
	500Ω <sup>[2]</sup>	0.01Ω	0.05%+10
	5kΩ	0.0001kΩ	0.05%+10
	50kΩ	0.001kΩ	
	500kΩ	0.01kΩ	0.1%+10
	5MΩ	0.001MΩ	0.2%+20
	50MΩ	0.001MΩ	2%+20

[1] Add 10 counts by temperature influence.

[2] Add 4 counts by temperature influence.

Function	Range	Resolution	Accuracy
Capacitance	5nF <sup>[1]</sup>	0.001nF	±(2% + 40)
	50nF <sup>[1]</sup>	0.01nF	
	500nF	0.1nF	±(2% + 40 digits)
	5µF	0.001µF	
	50µF	0.01µF	
	500µF	0.1µF	
	10mF	0.01mF	±(5% +40 digits)

[1] with a film capacitor or better ,using relative mode (REL ) to zero residual.

Function	Range	Resolution	Accuracy
Frequency (electronic)	50Hz	0.001Hz	±(0.01% + 10)
	500Hz	0.01Hz	
	5kHz	0.0001kHz	
	50kHz	0.001kHz	
	500kHz	0.01kHz	
	5MHz	0.0001MHz	
	10MHz	0.001MHz	
	Sensitivity: 0.8V RMS min. @ 20% to 80% duty cycle and <100kHz; 5V RMS min @ 20% to 80% duty cycle and >100kHz.		
Frequency (electrical)	40.00-10kHz	0.01 - 0.001kHz	±(0.5% reading)
	Sensitivity: 1V RMS		

Function	Range	Resolution	Accuracy
Duty Cycle	0.1 to 99.90%	0.01%	±(1.2% reading + 2digits)
	Pulse width: 100µs - 100ms, Frequency: 5Hz to 150kHz		

Function	Range	Resolution	Accuracy
Temp (type-K)	-50 to 1000°C	0.1°C	±(1.0% reading + 2.5°C)
	-58 to 1832°F	0.1°F	±(1.0% reading + 4.5°F)

(Probe accuracy not included)

Digital Oscilloscope, is of compact size, powerful and easily operated; TFT color LCD display, realizing its ease of use which can greatly improve customer's work efficiency.

Digital Oscilloscope performs outstandingly, powerful, affordable, with a high cost performance. Its real time sample rate is up to 50 MSa/s, can meet the market needs of high capture speed, complicated signal; supports internal storage and Bluetooth data transmission, customer can take repeated measurements and prints of the data graph by upper computer.

This meter measures AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Frequency (electrical & electronic), Duty Cycle, Diode Test, Insulation Test, and Continuity plus Thermocouple Temperature. It can store and recall data. It features a waterproof, rugged design for heavy duty use. Proper use and care of this meter will provide many years of reliable service.

- I HOLD Freezes the present reading in the display and allows the display to be saved. Also accesses AutoHold.
- I Brand new design, compact size, simple portability
- I TFT color LCD display, waveform display much more clear and stable
- I Real time sample rate: 500Sps—50 Msa/s
- I Storage depth: 3Kpts
- I Trigger function: rising edge, falling edge
- I Waveform record
- I Auto search
- I 10 set waveform storage/output; waveform data can be transmitted by Bluetooth or wireless USB interface to upper computer for further operation
- I Cursor test
- I Multi-screen display for channel waveform and FFT waveform
- I Menu display mode, much flexible and natural operation for customer
- I English online help system
- I A user manual
- I Product warranty card
- I Certificate of quality
- I One set of 1:1 probe
- I One adaptor
- I A charger according with user's country standard
- I CD (pc software)

### General Specification

Function	Main specification	Format or note
LCD display	3.5" color TFT-LCD; 320 X 240 pixels	
Refresh rate	15~50 V/S	Fast / Slow
Bandwidth	10MHz	0- 10 MHz
Input	Coupling, AC, DC	AC, DC
Input impedance	1000C/CA:1MΩ +/-2% // 15pF +/-2pF	
Max input voltage	1000V/600V (DC+AC peak value, 1MΩ input impedance)	CAT I, CAT II
Probe attenuation	1X	
Sampling mode	Real time sampling, random sampling	Single channel 3K,
Real time sample rate	50MSa/s~ 500pts	
Sampling resolution	8 bits	
Record length	3K / 10pages	SRAM
Storage length	10 charts	EEPROM
Time error	±5 s / 24hours	
FFT collect	4-256 points	
Bluetooth transmission rage	9600 baud rate	
Li-ion battery	8.4V 2300mAH	