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UNI-T®

UT8805E
Databook

www.uni-trend.com

UT8805E is a 200000 count benchtop digital multimeter with high precision, multi-function and full-automatic measurements for various requirements.

Basic measurements：

DC voltage measurement: 200mV, 2V, 20V, 200V, 1000V
DC current measurement: 200μA, 2mA, 20mA, 200mA, 2A, 10A
AC voltage measurement: RMS 200mV, 2V, 20V, 200V, 750V
AC current measurement: RMS 2mA, 20mA, 200mA, 2A, 10A
Resistance measurement: (2-wire, 4-wire) 200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 10MΩ, 100MΩ
Capacitance measurement: 2nF, 20nF, 200nF, 2μF, 20μF, 200μF, 2mF
Continuity test: fixed 2kΩ
Diode test: 0V-4V
Frequency measurement: 20Hz-1MHz
Cycle measurement: 1μs-0.05s
Temperature measurement: thermocouple and thermal resistance sensor supported

Mathematical functions:

Maximum, minimum, average, standard deviation, relative measurement, bar chart, histogram, trend chart, dB/ dBm, Pass/Fail, etc.

Humanization design

With easy-operating user interface and help system, Chinese & English menu, dual display and both U-disk and local storage supported.

Applications:

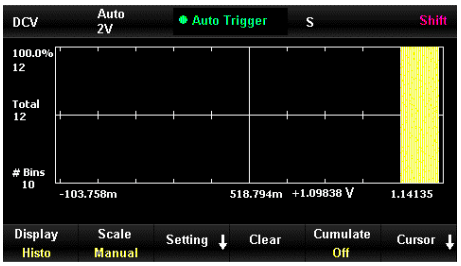
Research and education
Research and development
Detection and maintenance
Calibration
Automated testing

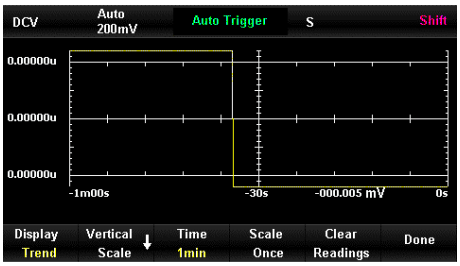
Features:

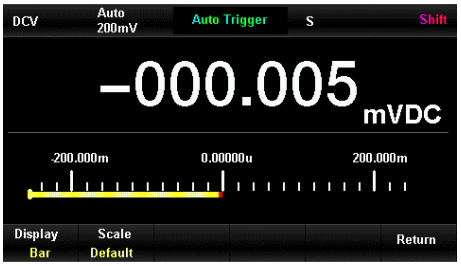
4.3-inch 480*272 TFT-LCD
200000 count resolution
Up to 5k reading/s reading speed
True-RMS AC voltage/current measurement
1GB NAND Flash storage, mass storage system and test data
Built-in thermocouple cold junction compensation
Supports standard SCPI remote control command and software of upper computer, the latest mainstream multimeter command set compatible
Dual display, Chinese & English menu and built-in help system
Configuration interfaces: USB Device, USB Host, LAN, GPIB, RS-232C
Settings and the measured data can be record and read by VXI11, USBTMC and U-disk conveniently

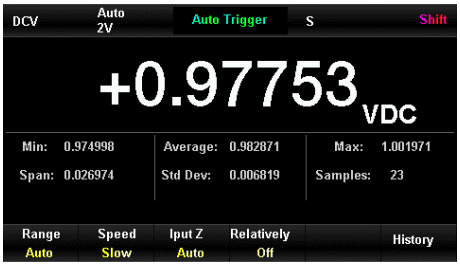
Design Features

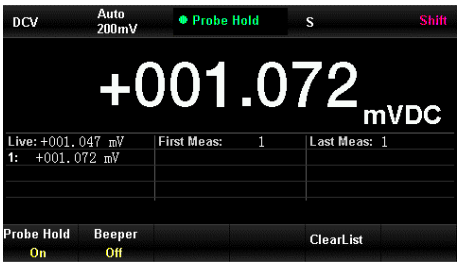
Histogram, trend chart, bar chart、mathematical statistics function, dual display, hold function, dBm function, configuration interface

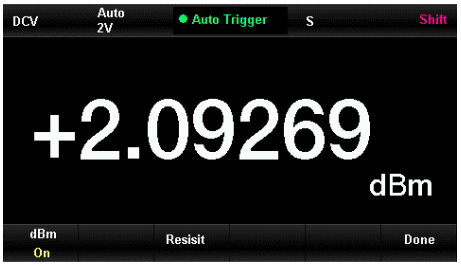












Specification:

DC Characteristics				Accuracy ±(%reading＋%range)[1]		
Function	Range [2]	Test current or load voltage	Input impedance	90-day accuracy 23°C±5°C	1-year accuracy 23°C±5°C	Temperature coefficient 0°C -18°C 28°C -50°C
DC voltage (DCV)	200.000mV		10MΩ or >10GΩ	0.008+0.004	0.01+0.004	0.0015+0.0005
	2.00000V		10MΩ or >10GΩ	0.008+0.003	0.01+0.003	0.0010+0.0005
	20.0000V		10MΩ or >10GΩ	0.008+0.004	0.01+0.004	0.0020+0.0005
	200.000V		10MΩ	0.012+0.003	0.015+0.003	0.0015+0.0005
	1000.00V[3]		10MΩ	0.012+0.003	0.015+0.003	0.0015+0.0005
DC current (DCI)	200.000μA	<30mV		0.050+0.005	0.055+0.005	0.003+0.001
	2.00000mA	<0.3V		0.050+0.005	0.055+0.005	0.002+0.001
	20.0000mA	<30mV		0.070+0.020	0.095+0.020	0.008+0.001
	200.000mA	<0.3V		0.060+0.008	0.070+0.008	0.005+0.001
	2.00000A	<0.1V		0.150+0.020	0.170+0.020	0.013+0.001
	10.0000A[4]	<0.3V		0.200+0.010	0.250+0.010	0.008+0.001
Resistance[5](R)	200.0000Ω	1mA		0.012+0.005	0.030+0.005	0.003+0.0006
	2.00000kΩ	1mA		0.012+0.003	0.020+0.003	0.003+0.0005
	20.0000kΩ	100μA		0.012+0.003	0.020+0.003	0.003+0.0005

	200.000kΩ	10μA		0.012+0.004	0.020+0.004	0.003+0.0005
	2.00000MΩ	1μA		0.020+0.004	0.040+0.004	0.004+0.0005
	10.0000MΩ[6]	500nA		0.100+0.004	0.250+0.004	0.010+0.0005
	100.000MΩ	500nA ‖ 10MΩ		0.800+0.004	1.75+0.004	0.200+0.0005
Diode test	0~2.0000V[7]	1mA		0.05+0.03	0.05+0.03	0.005+0.005
	2.0000V~4.0000V	1mA		0.07+0.03	0.15+0.03	0.005+0.005
Continuity test	2000Ω	1mA		0.05+0.03	0.05+0.03	0.005+0.005

Note:

[1] The index is obtained after preheating for half an hour, uses slow speed measurement and the calibration temperature is 18°C~28°C.

[2] All scales except DCV 1000V and DCI 10A are allowed to exceed the range by 20%.

[3] Beyond ±500 VDC, error of 0.002 will be added every 1V exceeds.

[4] For continuous current > DC 7A or AC rms7A, it should be disconnected for 30s after connected 20s.

[5] For 4-wire resistance measurement or 2-wire mode with relative operation; ±0.2Ω additional error will be added in 2-wire resistance measurement without relative operation.

[6] The humidity requirement in scales of 10MΩ and 100MΩ is <60%.

[7] The accuracy is only for voltage measurement of input terminal, the typical value of test current is 1mA. The current source change will cause some variation in the voltage drop on the diode junction.

AC Characteristics **Accuracy ±(%reading＋%range)[1]**

Function	Range [2]	Range of frequency	90-day accuracy 23°C±5°C	1-year accuracy 23°C±5°C	Temperature coefficient 0°C -18°C 28°C -50°C
True RMS AC voltage[3] (ACV)	200.000 mV	20Hz~45Hz	1.5+0.10	1.5+0.10	0.01+0.005
		45Hz~20kHz	0.19+0.05	0.2+0.05	0.01+0.005
		20kHz~50kHz	1.0+0.05	1.0+0.05	0.01+0.005
		50kHz~100kHz	3.0+0.05	3.0+0.05	0.05+0.010
	2..00000 V	20Hz~45Hz	1.5+0.10	1.5+0.10	0.01+0.005
		45Hz~20kHz	0.19+0.05	0.2+0.05	0.01+0.005
		20kHz~50kHz	1.0+0.05	1.0+0.05	0.01+0.005
		50kHz~100kHz	3.0+0.05	3.0+0.05	0.05+0.010
	20..0000 V	20Hz~45Hz	1.5+0.10	1.5+0.10	0.01+0.005
		45Hz~20kHz	0.19+0.05	0.2+0.05	0.01+0.005
		20kHz~50kHz	1.0+0.05	1.0+0.05	0.01+0.005
		50kHz~100kHz	3.0+0.05	3.0+0.05	0.05+0.010
	200..000 V	20Hz~45Hz	1.5+0.10	1.5+0.10	0.01+0.005
		45Hz~20kHz	0.19+0.05	0.2+0.05	0.01+0.005
		20kHz~50kHz	1.0+0.05	1.0+0.05	0.01+0.005
		50kHz~100kHz	3.0+0.05	3.0+0.05	0.05+0.010
	750..000 V[4]	20Hz~45Hz	1.5+0.10	1.5+0.10	0.01+0.005

		45Hz~20kHz	0.19+0.05	0.2+0.05	0.01+0.005
		20kHz~50kHz	1.0+0.05	1.0+0.05	0.01+0.005
		50kHz~100kHz	3.0+0.05	3.0+0.05	0.05+0.010
True RMS AC current[5] (ACI)	2.00000 mA	20Hz~45Hz	1.5+0.10	1.5+0.10	0.015+0.015
		45Hz~2kHz	0.5+0.10	0.5+0.10	0.015+0.006
		2kHz~10kHz	2.5+0.20	2.5+0.20	0.015+0.006
	20.0000 mA	20Hz~45Hz	1.5+0.10	1.5+0.10	0.015+0.005
		45Hz~2kHz	0.5+0.10	0.5+0.10	0.015+0.005
		2kHz~10kHz	2.5+0.20	2.5+0.20	0.015+0.005
	200.000 mA	20Hz~45Hz	1.5+0.10	1.5+0.10	0.015+0.005
		45Hz~2kHz	0.3+0.10	0.3+0.10	0.015+0.005
		2kHz~10kHz	2.5+0.20	2.5+0.20	0.015+0.005
	2.00000 A	20Hz~45Hz	1.5+0.20	1.5+0.20	0.015+0.005
		45Hz~2kHz	0.5+0.20	0.5+0.20	0.015+0.005
		2kHz~10kHz	2.5+0.20	2.5+0.20	0.015+0.005
	10.0000 A[6]	20Hz~45Hz	1.5+0.15	1.5+0.15	0.015+0.005
		45Hz~2kHz	0.5+0.15	0.5+0.15	0.015+0.005
		2kHz~10kHz	2.5+0.20	2.5+0.20	0.015+0.005

Additional crest factor error (Non-sine wave)[7]	
Crest coefficient	Error(%range)
1-2	0.05
2-3	0.2

Note:

[1] The index is obtained after preheating for half an hour, uses slow speed measurement and the calibration temperature is 18°C~28°C.

[2] All scales except ACV 750V and ACI 10A are allowed to exceed the range by 20%.

[3] The index is obtained under the sinusoidal signal with amplitude of >5%; When the input is within 1%~5% and the frequency is <50kHz, the additional error, 0.1% of range is added.

[4] Beyond 400VAC, error of 0.025V will be added every 1V exceeds.

[5] The index is obtained under the sinusoidal signal with amplitude of >5%; When the input is within 1%~5%, the additional error, 0.1% of range is added.

[6] For continuous current > DC 7V or AC rms7A, it should be disconnected for 30s after connected 20s.

[7] when the frequency is < 100Hz

Frequency and Cycle Characteristics				**Accuracy ±(%reading)**	
Features	Range	Range of frequency	90-day accuracy 23°C±5°C	1-year accuracy 23°C±5°C	Temperature coefficient 0°C -18°C 28°C -50°C
Frequency and cycle	200mV~750V[2]	20Hz~2kHz	0.01+0.003	0.01+0.003	0.002+0.001
		2kHz~20kHz	0.01+0.003	0.01+0.003	0.002+0.001

		20kHz~200kHz	0.01+0.003	0.01+0.003	0.002+0.001
		200kHz~1MHz	0.01+0.005	0.01+0.006	0.002+0.002

Note:

[1] The index is obtained after preheating for half an hour.

[2] Besides especially marked, when the frequency is < 100kHz, the index is AC input voltage in 15%~120% scale, and when the frequency is > 100kHz, the index is applicable to scale of 30%~120%. The 750V scale is limited in 750Vrms, and the accuracy in 200mV scale is multiplied the % reading error by 10.

Capacitance Characteristics				**Accuracy ±(%reading＋%range)[1]**	
Features	Range	Maximum test current	90-day accuracy 23°C±5°C	1-year accuracy 23°C±5°C	Temperature coefficient 0°C -18°C 28°C -50°C
Capacitance [2]	2.000nF	0.5μA	2.8+1.0	3+1.0	0.08+0.002
	20.00nF	1μA	1+0.5	1+0.5	0.02+0.001
	200.0nF	10μA	1+0.5	1+0.5	0.02+0.001
	2..000μF	100μA	1+0.5	1+0.5	0.02+0.001
	20..00μF	1mA	1+0.5	1+0.5	0.02+0.001
	200.0μF	1mA	1+0.5	1+0.5	0.02+0.001
	2.000mF	1mA	2+0.5	2+0.5	0.02+0.001

Note:

[1] The index is obtained after preheating for half an hour.

[2] The parameter is applicable to capacitance between 1%~120% in 2nF scale. In other scales, capacitance is between 10%~120%.

Temperature Characteristics				**Accuracy ±(%reading＋%range)[1]**	
Function	Type of probe	Model of probe	Operating temperature	1-year accuracy 23°C±5°C	Temperature coefficient 0°C -18°C 28°C -50°C
Temperature	RTD[2]	α=0.00385	-200°C~660°C	0.16°C	0.008+0.002
	Thermocouple[3]	B	0°C~1820°C	0.76°C	0.14°C
		E	-270°C~1000°C	0.5°C	0.02°C
		J	-210°C~1200°C	0.5°C	0.02°C
		K	-270°C~1370°C	0.5°C	0.03°C
		N	-270°C~1300°C	0.5°C	0.04°C
		R	-50°C~1760°C	0.5°C	0.09°C
		S	-50°C~1760°C	0.6°C	0.11°C
		T	-270°C~400°C	0.5°C	0.03°C

Note:

[1] The index is obtained after preheating for half an hour and the probe error is not contained.

[2] The index is suitable for 2-wire/4-wire relative measurement.

[3] Built-in cold junction compensation is near the rubber tip of test leads and its measuring error is ±2°C.

Measuring methods and other features	
DC voltage	
Input resistance	10MΩ or > 10GΩ for scales of 200mV, 2V and 20V
	10MΩ ±2% for scale of 20V, 200V and 1000V
Input bias current	< 30 pA, 25°C test
Input protection	1000 V for all ranges
Common mode rejection ratio	120dB (maximum ±500 VDC for 1kΩ balancing resistance of LO test lead)
Normal mode rejection ratio	60 dB (slow reading speed)
Resistance	
Measuring method	4-wire/2-wire resistance selectable
Input protection	1000 V for all ranges
DC current	
Current diverter	Sample resistance 100Ω in 200mA and 2mA scale
	Sample resistance 1Ω in 20mA and 200mA scale
	Sample resistance 8mΩ in 2A and 10A scale
Input protection	250mA, 250V replaceable fast fuse on rear panel
	Internal 10A, 250V slow fuse
Continuity/diode test	
Measuring method	Use constant flow source of 1mA ± 5% measure resistance or voltage
Buzzer	Yes
Continuity threshold	Adjustable
Input protection	1000V
True RMS AC voltage	
Measuring method	AC coupling true RMS measurement, maximum 1000V offset in arbitrary range
Crest factor	Crest factor ≤3 in full range

Input impedance	1MΩ±2% in all ranges with < 100 pF in parallel
AC filter bandwidth	20Hz~100kHz
Common mode rejection ratio	60 dB (for 1kΩ balancing resistance of LO test lead and < 60Hz, maximum ±500 VDC)
True RMS AC current	
Measuring method	Coupling DC to shunt resistor, and coupling AC to true RMS measurement (measure input AC component)
Crest factor	Crest factor ≤3 in full range
Maximum input	RMS current < 10 A with DC component
Shunt resistor	0.008 Ω in 2A and 10A scale, 1Ω in 20mA and 200mA scale, 100Ω in 200μA and 2mA scale
Input protection	250mA, 250V replaceable fast fuse on rear panel
	Inter 10A, 250V slow fuse
Cycle and frequency	
Measuring method	Measure the time of signal cycle number and then calculate the frequency
Notice	Error will be introduced for low voltage and low frequency signal by all frequency meter
Capacitance measurement	
Measuring method	Charge the capacitance by constant current, and measure the average speed of voltage rising
Connecting method	2-wire
Input protection	All ranges 1000 V
Arbitrary sensor measurement	
Measuring method	Thermocouple, DCV, DCI, Ω(2-wire/4-wire), frequency output type sensor and built-in thermocouple cold junction compensation supported
Output polarity	Positive/negative selectable
Others	Preset conversions for ITS-90, Pt100 and Pt385 of B, E, J, K, N, R, S, T type thermocouple
Frequency response	
True RMS measurement	100kHz
Sampling and trigger	
Maximum measuring speed	5000rdgs/s (2.5 reading/s; 10 reading/s; 5k reading/s)

Trigger delay	6ms~10000ms optional	
External trigger input	Input level	TTL compatible
	Trigger condition	Rising edge/falling edge optional
	Input impedance	> 20kΩ /400pF (DC coupling)
	Minimum pulse width	500μs
VMC output	Level	TTL compatible (input ≥1kΩ load)
	Output polarity	Positive/negative selectable
	Output impedance	200Ω (typical)
History recording		
Volatile memory	10k reading record	
Non-volatile memory	1GB NAND Flash storage, mass storage system and test data	
	6 sets of preset value configuration	
	External U-disk expansion is supported	
Mathematical functions		
Mathematical operations	Pass/Fail, Relative, min/max/average, standard deviation, dBm, dB, Hold, histogram, trend chart, bar chart	
Interfaces		
Interfaces type	USB Host, USB Device, LAN , RS-232C, GPIB(optional)	

General characteristic:

Power supply:

AC 90V ~ 110V，45 ~ 440Hz

AC 110V ~ 132V，45 ~ 440Hz

AC 200V ~ 240V，45 ~ 66Hz

AC 216V ~ 264V，45 ~ 66Hz

Power dissipation: MAX 20W

Mechanical features:

Size: 260mm*116mm*332mm
Weight: 4.4kg
Color: off white and grey

Other features:

Accurate operating environment: 0°C~28°C<90%; 28°C~40°C<75%; 40°C~55°C<50% (no condensation)
Storage environment: -20°C~70°C, <95%; the instrument needs to run continuously for at least 7 days after high humidity storage.
Altitude: ≤2000 m
Vibration: MIL-T-28800E, category III, class 5 (only for sine wave)

Electromagnetic compatibility: complies with low-voltage command (2004/108/EC) and standard EN61326-1:2013.

Safety: complies with low-voltage command (2006/95/EC), and standard EN61010 - 1:2010

(to be confirmed)

Remote interface 10 / 100Mbit LAN, USB Device, USB Host, RS-232C

Programming language: The latest mainstream multimeter SCPI command set compatible
Preheat: 30 minutes

Package:

UT8805E device----------1
Three-core power line----------1
Test leads----------1 pair
USB connecting line----------1
RS232 connecting line----------1
UT8805E quick guide----------1
UT8805E warranty card----------1
Upper computer software----------1 set

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