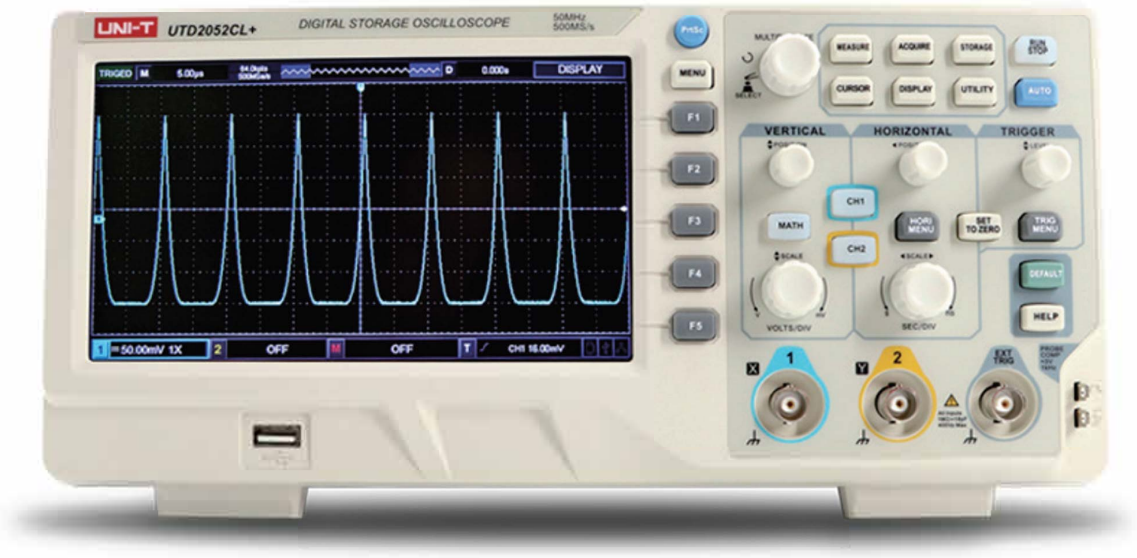
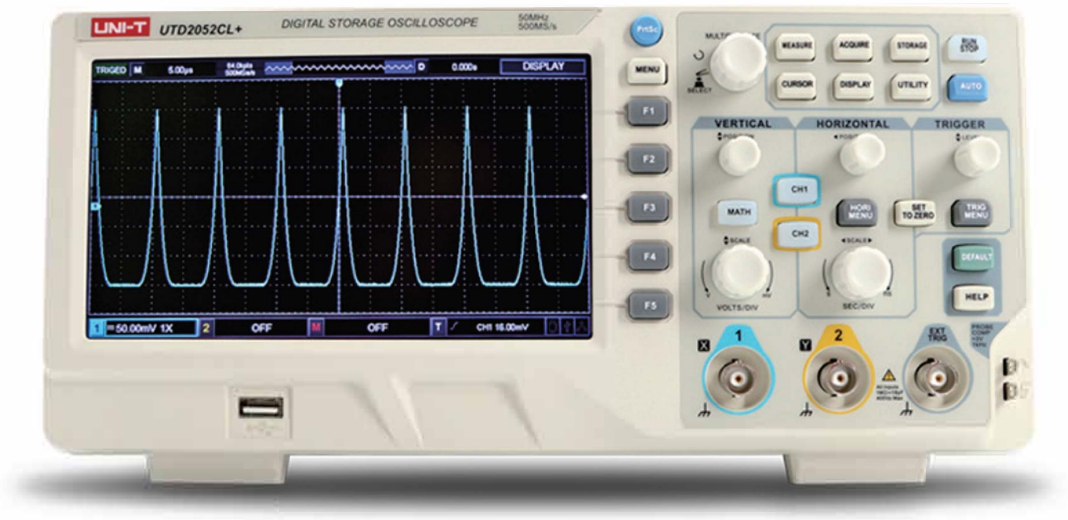
UNI-T



Data Sheet

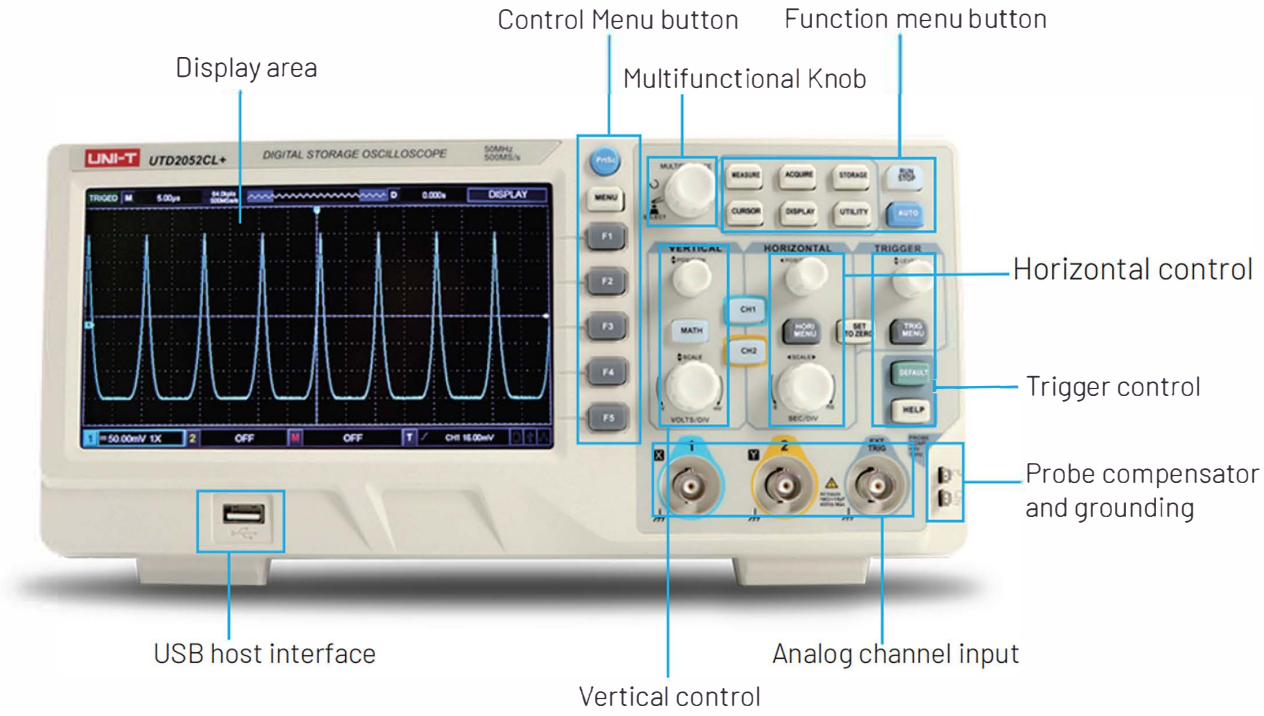
UTD2000CL+ Series Digital Oscilloscope



Main Features

- Bandwidth: 150MHz/250MHz
- Measurement channel: 2/4 analog channel, 16 digital channel
- Real-time sampling rate: 2.5GS/s
- Storage depth: 70Mpts per channel
- Waveform capture rate: 200,000wfms/s
- Gray level: 256
- Auto measurement: 34 waveform types
- Waveform record: record original data 100,000 frame at the same time
- Abundant trigger: edge, pulse width, runt, exceed-amplitude, N-edge, delay, timeout, duration, setup hold, slope, video, code pattern
- Bus encoding: RS232, IIC, SPI, USB, CAN
- Independent time base: each channel can adjust independently
- Display: 8inch WVGA (800×480) TFT LCD, super-widescreen, vivid color, clean display
- Peripheral interface: USB Host, USB Device, LAN, EXT Trig, AUX OUT(Trig out, Pass/Fail) output, signal source output interface AWG, VGA and multimeter module UT-M12 (optional)
- Waveform generator: built-in double channel, maximum 50MHz arbitrary waveform generator

Oscilloscope Panel

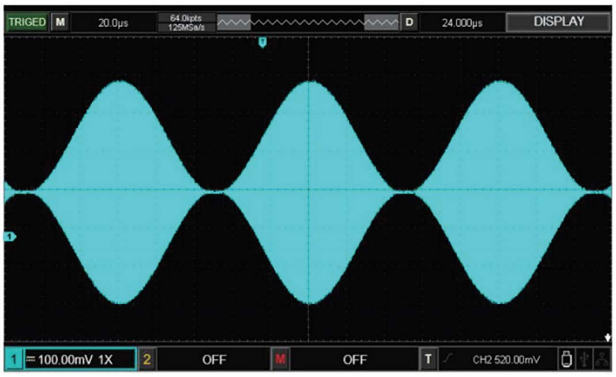


Product Introduction

UTD2000CL+ Series aims to provide schools with digital storage oscilloscopes that are very close to those used in industries, so as to narrow the equipment gap between teaching and industries, so that graduates can easily start immediately after employment. Besides, the specifications are upgraded on the basis of the original UTD2000CL series to give back to the majority of UNI-T loyal users.

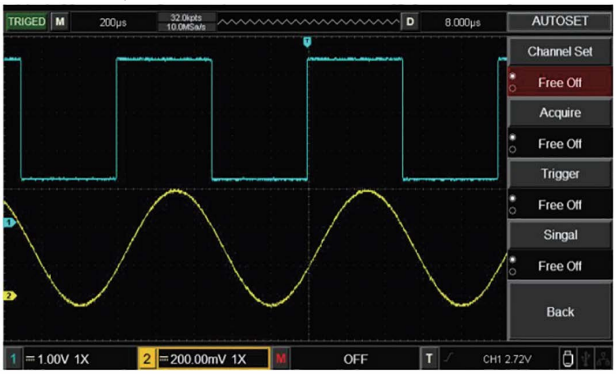
Wider display range

UTD2000CL+ Series oscilloscope has a wider display range 8div×16div, Display more periodic waveforms and better display details. Give you more specific waveform experience.



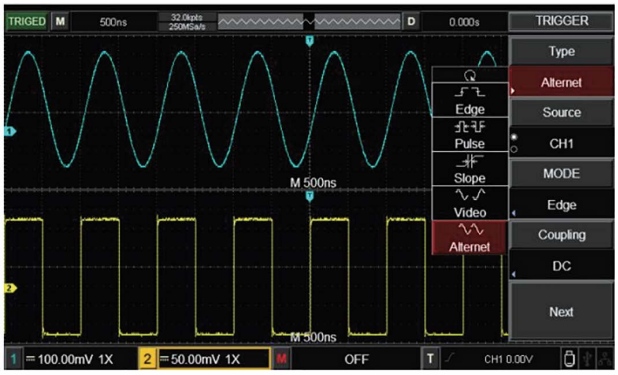
New auto strategy

UTD2000CL+ Series has a new AUTOSET function. You can customize the scope of one button auto function under the AUTOSET menu. After customization, it is more suitable for teaching and beginners to learn the operation of oscilloscope, so that you can understand the setting and use of oscilloscope in more detail.



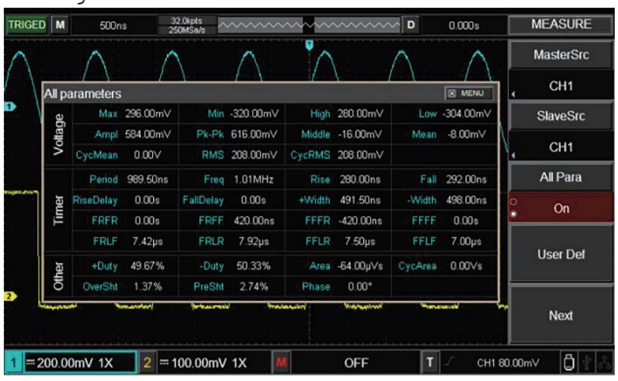
Multi-mode Trigger

UTD2000CL+ Series has edge、pulse width、slope trigger、video trigger、alternating trigger and other trigger methods help you capture waveforms quickly and accurately. The alternative trigger method enables you to trigger two asynchronous waveform signals at the same time, allowing you to trigger two signals at the same time and analyze the details.



Auto Measurement

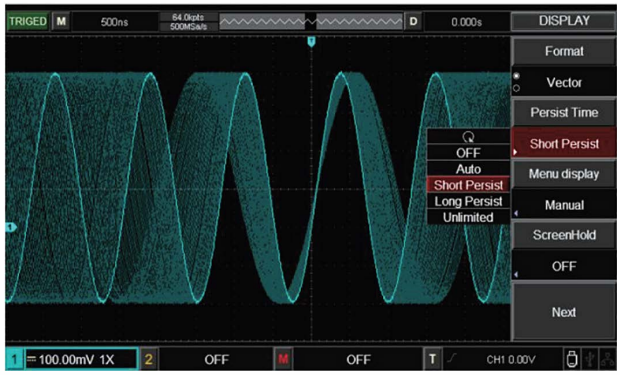
UTD2000CL+ Series has a complete set of analytical tools. Menu can open 34 auto measurement items to provide a large number of testing source, directly to display signal measurement. It is perfectly meet the requirements of signal quality measurement. It eliminates some basic and complicated calculations and saves time for experiments and testing.



Steady Persistence Display

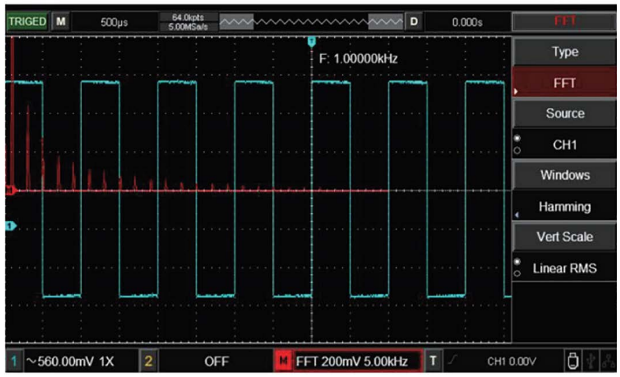
UTD2000CL+ Series has long afterglow display function, which can help you measure the long-term cumulative performance of waveforms,

observe the occurrence of abnormal signals, and help you measure the synchronization relationship between two signals. This function is divided into long afterglow, short afterglow and infinite afterglow. You can choose according to specific test conditions.



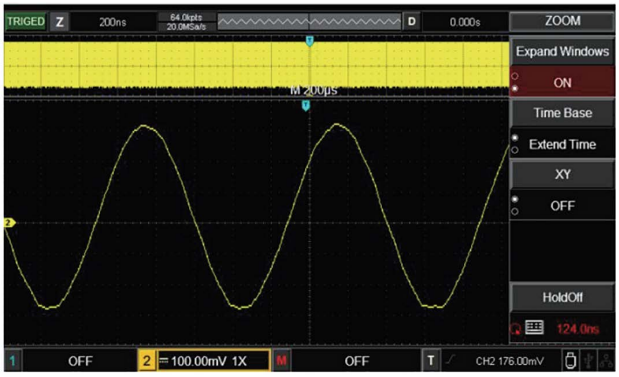
Mathematical Operation

UTD2000CL+ Series can execute multiple mathematical operation, such as Math, FFT, Digital Filter. Enter mathematical operation menu, select operation mode, result waveform will be lighted by red M mark after operation.



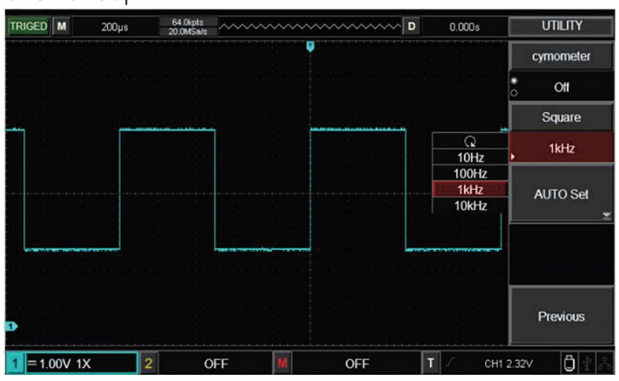
Area magnification

If you need to observe the waveform of the whole domain and want to take into account the details, UTD2000CL+ Series provides you with local amplification function. You just need to open it in the menu, and the detailed waveform will be presented in front of you.



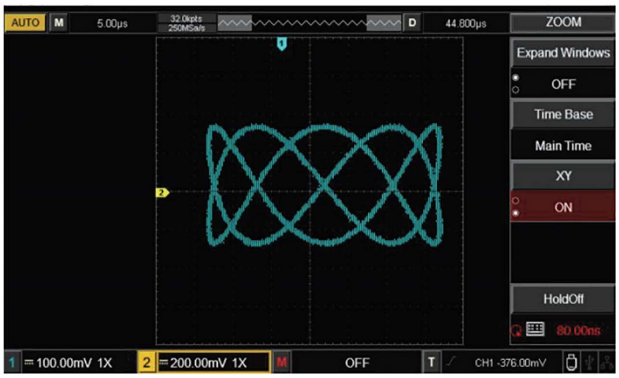
Multiple square waves

UTD2000CL+ Series provides standard square wave signals of multiple frequencies. You can calibrate the probe with the help of your own square wave before using the oscilloscope. It can also provide comparison reference for the tested waveform with the help of the standard square wave of the oscilloscope.



Lissajous waveform phase measurement

UTD2000CL+ Series supports Lissajous waveform phase measurement. Selects XY mode can perfectly present the waveform phase diagram, so that learners can more intuitively see the effect of phase change. It is easy to operate and makes the teaching effect more vivid.



Quick Model Selection

Model	UTD2052CL+	UTD2102CL+
Analog Bandwidth	50MHz	100MHz
Channels	2	2
Real-time	500MS/s	500MS/s
Equivalence	25GS/s	25GS/s
Storage depth	64 kpts	64 kpts
Capture rate	5000 wfms/s	5000 wfms/s
Rise Time(Typical)	≤7ns	≤3.5ns

Technical Specification

Horizontal System Specification	
Time-base scale	2ns/div-50s/div
Waveform interpolation	Sin(x)/x
Time-base accuracy	≤(50+2×Service life)ppm
Record length	2×512k sampling point
Storage depth	Single channel: 64k; Double channel: 32k
Sampling rate and delay time accuracy	±50ppm (any time interval ≥1ms)
Measurement accuracy of time interval (△T)(full bandwidth)	Single time: ±(1sampling time interval+50ppm×reading+0.6ns) >16 average values: ±(sampling time interval+50ppm×reading+0.4ns)
Vertical	
Analog-to-digital converter(A/D)	8bit
Deflection factor range(V/div)	1mV/div~20 V/div(at 1-2-5 increment)
Position range	≥±8div
Selectable bandwidth limitation(Typical)	20MHZ
Low frequency response (AC Coupling, -3dB)	≤5 Hz(above BNC)
DC gain accuracy (sampling or average sampling mode)	5mV ~20V/div: ≤±3% 1mV ~2mV/div: ≤±4%
DC measurement accuracy (average sampling mode)	When vertical position is 0 and N≥16: ±(4%×reading+0.1div+1mV)and selects 1mV ~2mV/div; ±(3%×reading+0.1div+1mV) and selects 10mV~20V/div; When vertical position is not 0 and N≥16: ±[3%×(reading + vertical position reading) +(1%×vertical position reading)]+0.2div) The setting from 5mV/div to 200mV/div plus 2mV; the setting value from 200mV/div to 20V/div plus50mV
Measurement accuracy of voltage difference(△V) (average sampling mode)	Under the same setting and environment conditions and after averaging the captured waveforms with a quantity of ≥16, the voltage difference (ΔV) between any two points on the waveform: ±(3%×reading+0.05div)
Trigger System Specifications	
Trigger sensitivity	≤1div
Range of trigger level	Interior: From the screen center±10div EXT: ±3V
Trigger level accuracy (Typical) applicable for the signal with rising and falling time ≥20ns	Interior: ±(0.3div×V/div)(within±4 div from the screen center) EXT: ±(6% setting value+40mV)

Pre-trigger capacity	Normal mode/scan mode, pre-trigger/delay trigger, the pre-trigger depth is adjustable.
Hold-off range	80ns~1.5s
Set the level to 50% (Typical)	Operate under the condition of input signal frequency of ≥50Hz
Trigger mode	AUTO, normal, single
High-frequency holdoff	Hold off signals over 80kHz4096 and 8192
Low-frequency holdoff	Hold off signals below 80kHz
Trigger mode	
Edge	Rise, fall, arbitrary edge
Pulse width	Pulse width term: >、<、=
	Polarity: positive pulse width, negative pulse width
	Pulse width range: 20ns~10s
Slope trigger	Slope condition: Positive slope(>, <, within the scope); Negative slope(>, <, within the scope)
	Time: 20ns~10s
Video trigger	Trigger sensitivity(Typical): 2div Vpp Signal model and line/field frequency(video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-525 (NTSC) and 1-625 (PAL)
Alternating trigger	Alter: Edge, Pulse, Slope
Measurements	
Cursor	Manual mode Voltage difference between cursors(ΔV),Time difference between cursors(ΔT),Reciprocal of ΔT (Hz)(1/ΔT))
	Track mode: Voltage value and time value of point of waveform.
	Auto measurement mode: Cursor display is allowed on auto measurement mode.
Automatic measurement	Vpp, Vamp, Vmax, Vmin, Vtop, Vbase, Vmid, Average, Vrms, Overshoot, Preshoot, Frequency, Period, RiseTime, FallTime, +Width, Width, +Duty, Duty, Delay, FRFR, FRFF, FFFR, FFFF, FRLF, FRLR, FFLR, FFLF
Measurement quantity	Display 5 types of measurement at the same time.
Measurement scope	Screen or cursor
Measurement statistics	Average value, maximum value, minimum value and standard deviation.
Math	
Math operation	+,-,×,÷
Window	Rectangle、 Hanning、Blackman 、 Hamming
Vertical scale	Vrms、 dBVrms
Digital filtering	Low pass, high pass, band pass, band reject
Storage	
Setting	Internal: 20 groups. USB: 200 groups
Reference waveform	Internal: 20 groups. USB: 200 groups
Data file	Internal: 20 groups. USB: 200 groups
Bitmap	USB: 200 groups, in BMP format.
Input Channel Specifications	
Input Coupling	DC, AC and GND
Input impedance	(1MΩ± 2%)//(18pF± 3 pF)
Probe attenuation coefficient	0.01×/0.02×/0.05×/0.1×/0.2×/0.5×/1×/2×/5×/10×/20×/50×/100×/200×/500×/1000×
Maximum input voltage	400Vpk, the transient over voltage is 1000 Vpk.
Display	
Displays types	LCD with Diagonal of 178mm (7-inch)
Display resolution	800 horizontal×RGB× 480 vertical pixels
Display color	Color
Waveform luminance	Adjustable
Backlight intensity (Typical)	300nit
Language	Multi-language
Interface function	
Standard configuration	Standard USB Host, USB Device, EXT Trig, Pass/Failt Option: Multimeter module(UT-M12), LAN

Trigger frequency meter	
Reading resolution	6bits
Trigger sensitivity	
Accuracy(Typical)	±51ppm(+1character)
Probe compensator output	
Output voltage(Typical)	About 3Vpp, when the load≥1MΩ
Frequency(Typical)	10Hz,100Hz,1kHz(Default), 10kHz
Power Source	
Power voltage	100V-240V~(Fluctuations 10%) , 50/60Hz
Power consumption	100VA max
Fuse	F1.6A250V
Environment Specifications	
Intended use	Indoor use
Pollution degree	2
Operating temperature	Operating Temperature Range: 0℃~+40℃
Storage Temperature	Storage Temperature Range: -20℃~+60℃
Cooling	Build-in cooling fan
Operating Humidity Range	<35℃: ≤90%RH 35℃~40℃: ≤60%RH
Operating Altitude	Operating 2000 meters below Non-operating 15000 meters below
Mechanical specifications	
Size	306mm(W)×138(H)×124 mm(D)
Weight	Excluding package:2.5kg Including package: 3kg
Recommended calibration Interval	
The recommended calibration interval is one year.	

*The UTD2000CL_ series have been certified by CE, cETLus.

Standard accessories	
UT-P03(UTD2052CL+)	Passive probe x 2: 1x,10x switchable, 60MHz
UT-P04(UTD2102CL+)	Passive probe x 2: 1x,10x switchable, 100MHz
Power cable	Fits the standard of destination country
UT-D14 USB data cable	For UTD2052CL+,UTD2102CL+,UTD2072CL,UTD2152CL

Warranty

Three-years warranty, excluding probes and accessories.

To protect your investment, please purchase from UNI-T official authorized global distributors..

Contact UNI-T

UNI-T group maintains a wide products category includes Digital Test & Measurement instruments, Field Testing Meter, Infrared thermal imaging products. As early as 2008, we continue to introduce self-developed Digital Test and Measurement instruments to the market and have made remarkable achievements. At present, we have formed a variety of product lines of Oscilloscope, AWG, Spectrum Analyzer, Bench Multi-meter, Power Supply, DC Load, Power Meter, LCR Meter, Micro Ohm Meter and Data logger.