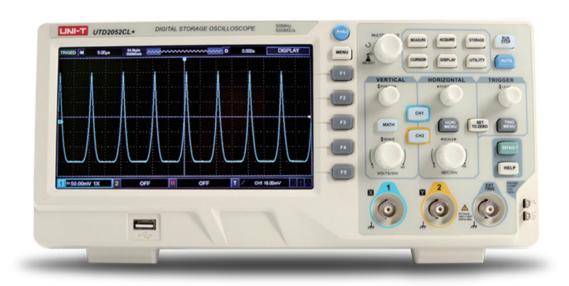


Data Sheet

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

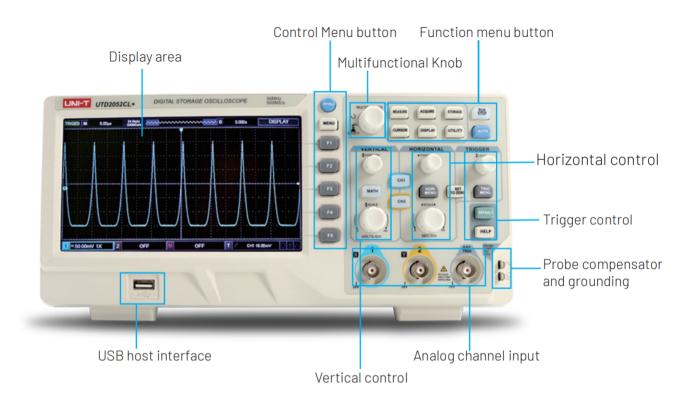
• Waveform capture rate: 200,000wfms/s

• 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



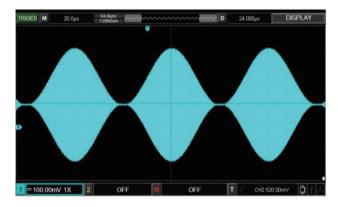


Product Introduction

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.

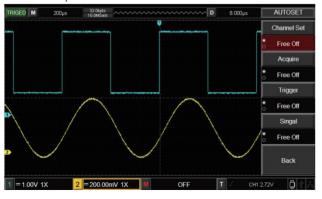
Wider display range

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



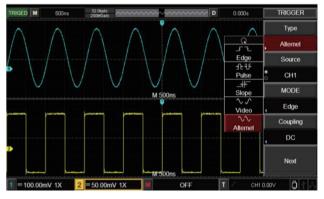
New auto strategy

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

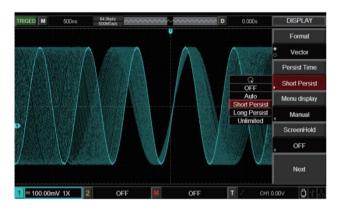
UTD2000CL+ Series has a complete set of analytical tools. Menu can open 34 auto measurement items to provide a large number of testing source, directly to display signal measurement. It is perfectly meet the requirements of signal quality measurement. It eliminates some basic and complicated calculations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



Steady Persistence Display

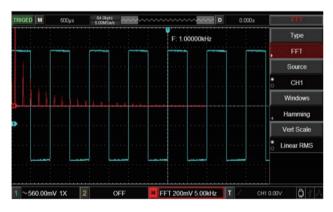
UTD2000CL+ Series has long afterglow display function, which can help you measure the long-term cumulative performance of waveforms,

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.



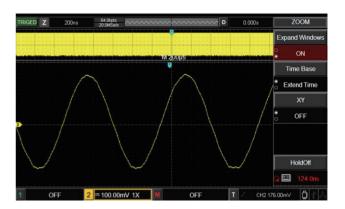
Mathematical Operation

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.



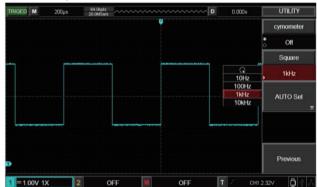
Area magnification

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.



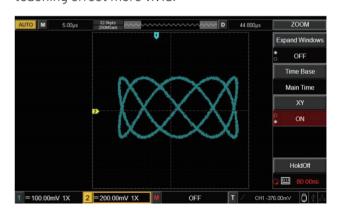
Multiple square waves

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 | O'reletine (According the time interest Floors and the O'rel | |
| of time interval | Single time: ±(1 sampling time interval+50ppm×reading+0.6ns) | |
| (△T)(full bandwidth) | >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 | 20MHZ | |
| limitation (Typical) | 201102 | |
| Low frequency response | ≤5 Hz(above BNC) | |
| (AC Coupling, -3dB) | 20115/d000AG DIAO) | |
| DC gain accuracy (sampling or | 5mV ~20V/div: ≤±3% | |
| average sampling mode) | 1mV ~2mV/div: ≤±4% | |
| | When vertical position is 0 and N≥16: | |
| | ±(4%×reading+0.1div+1mV)and selects 1mV ~2mV/div; | |
| DC measurement accuracy | ±(3%×reading+0.1div+1mV) and selects 10mV ~20V/div; | |
| (average sampling mode) | 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 200 mV/div to 20V/div plus 50 mV | |
| Measurement accuracy of | Under the same setting and environment conditions and after averaging the | |
| voltage difference(△V) | captured waveforms with a quantity of ≥16, the voltage difference (ΔV) between | |
| (average sampling mode) | 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 ±10 div EXT: ±3V | |
| Trigger level accuracy | Interior: ±(0.3div×V/div)(within±4 div from the screen center) | |
| (Typical) applicable for the signal with rising and falling time ≥20ns | EXT: ±(6% setting value+40mV) | |
| with Holling and Falling time 22011s | | |

| Internating expending | | | |
|--|--------------------------------|---|--|
| Set the level to 50% (Typical) Trigger mode AUTO, normal, single High-Trequency holdorf Loor-frequency holdorf Hold off signals below 80 kHz Trigger mode Figger Pulse width Pulse with the state of the signals below 80 kHz Trigger mode Figger Pulse width Pulse with the state of the state o | Pre-trigger capacity | Normal mode/scan mode, pre-trigger/delay trigger, the pre-trigger depth is adjustable. | |
| MITO, normal, single MITO, normal, single Hiddorf singlas bows 80MHz Hiddorf singlas bows 80MHz | Hold-offrange | 80ns~1.5s | |
| High-frequency boldoff Low-frequency boldoff Low-frequency boldoff Hold off signals below 80341z Flager mode Pulse width ramp: 20m - 9 Pulse width rampe: 20m - 9 Pulse width rampe: 20m - 9 Slepe trigger Flager mode Pulse width rampe: 20m - 90 Slepe trigger Flager mode and inferfield frequency (video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-526 INTSC) and 1-825 [PAL) Atternating trigger Atter: Edge, Pulse, Slope Flager mode and fine filed frequency (video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-526 INTSC) and 1-825 [PAL) Atternating trigger Atter: Edge, Pulse, Slope Flager mode video frequency (video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-526 INTSC) and 1-825 [PAL) Atternating trigger Atter: Edge, Pulse, Slope Flager mode video frequency (video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-526 INTSC) and 1-825 [PAL) Atternating trigger Atter: Edge, Pulse, Slope Flager mode video frequency (video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-526 INTSC) and 1-825 [PAL) Atternating trigger Atter: Edge, Pulse, Slope Flager mode video frequency (video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-526 INTSC) and 1-825 [PAL) Atternating trigger Atter: Edge, Pulse, Slope Flager mode video frequency (video trigger type): Support standard NTSC and PAL, and the line number scope is respectively 1-526 INTSC) and 1-825 [PAL) Automatic measurement due to the number scope is respectively 1-526 INTSC) and 1-825 [PAL) Automatic measurement due to the number scope is respectively 1-526 INTSC) and 1-825 [PAL) Automatic measurement due to the number scope is respectively 1-526 INTSC) and 1-825 [PAL) Automatic measurement due to the number scope is respectively 1-526 INTSC) and 1-825 [PAL) Automatic measurement Automatic meas | Set the level to 50% (Typical) | Operate under the condition of input signal frequency of ≥50Hz | |
| Forestand Fo | Trigger mode | AUTO, normal, single | |
| Figger mode Pulse width term: >- < < = Pulse width term: >- < < > < = Pulse width term: >- < < > < = Pulse width term: >- < < > < = Pulse width term: >- < < > < > < = Pulse width negative pulse width. Pulse width ange: 20ns-10s Slope trigger Slope condition: Postive slope(s, <, within the scope) Time: 20ns-10s Time | High-frequency holdoff | Hold off signals over 80kHz4096 and 8192 | |
| Rise, fall, arbitrary edge | Low-frequency holdoff | Hold off signals below 80 kHz | |
| Pulse width Pulse width term: >- < < = Pulse width Polarity; positive pulse width negative pulse width Polarity; positive pulse width negative pulse width Polarity; positive pulse width negative pulse width Polarity; positive slope(>, < within the scope) Time: 20ns-108 Time: 20ns-108 Time: 20ns-108 Time: 20ns-108 Tirger sensitivity(Typeal): 2div Vpp Signal model and line/field frequency (video trigger type): Support standard N INS and PAL, and the line number scope is respectively1-525 (NTSC) and 1-825 (PAL) Alternating trigger Measurements ### Manual mode Voltage difference between cursors (ΔV),Time difference between cursors (ΔT),Reciprocal of ΔT (Hz)(IVΔT Tark mode: Voltage value and time value of point of vave form. Automatic measurement Automatic measurement, Polarity Manual mode Voltage wilder and time value of point of vave form. Automatic measurement Automatic measurement #### Voltage value and time value of point of vave form. Automatic measurement Automatic measurement, Polarity Manual mode Voltage wilder and time value of point of vave form. Automatic measurement quantity #### Measurement quantity ### Measurement quantity ### Display 5 types of measurement at the same time. ### Measurement quantity ### Measurement quantity ### Measurement statistics ### Average value, maximum value, minimum value and standard deviation. #### ### Math operation ### ### Math operation ### ### Window ### Rectangle: Hanning, Blackman - Hanming ### Vortical Scale ### Vort | Trigger mode | | |
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| Slope condition: Positive slope(s, <, within the scope), Negative slope(s, <, within the scope) Time 2 Diss-10s Triger sensitivity(Typical): 2 div Vpp Signal model and file filled 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 Measurements Manual mode Voltage difference between cursors (AV). Time difference between cursors (AT). Reciprocal of AT (H2I(I)/AT Track mode: Voltage value and time value of point of waveform. Automatic measurement Automatic measurement Vpp, Vamp, Vmax, Vmin, Vtop, Vbase, Vmid, Average, Vms, Overshoot, Preshoot, Frequency, Period, RiseFime, Fall Time, +Width, Width, +Duty, Duty, Delay, FRER, FREF, FFER, FFE | Pulse width | Polarity: positive pulse width, negative pulse width | |
| Time; 20ns-10s Trigger eansitivity[Typical]: 2div Vpp Signal model and line/flied 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 Heasuremental Ucusor Manual mode Voltage difference between cursors (ΔV).Time difference between cursors (ΔT).Reciprocal of ΔT (Hz)III/ΔT Track mode: Voltage value and time value of point of waveform. Auto measurement mode: Cursor display is allowed on auto measurement mode. Vpp, Vamp, Vamax, Vmin, Vtop, Vbase, Vmid, Average, Vmms, Overshoot, Preshoot, Frequency, Period, Rieselime, Fall Time, Width, Width, Duty, Duty, Delay, ERFR, ERF, EFFR, ERLR, ERLR, EFLR, FELR Measurement avanity Display 5 types of measurement at the same time. **Screen or cursor** Average value, maximum value, minimum value and standard deviation. **Window** Rectangle. Hanning. Blackman . Hamming Vertical scale Vrms. dBVrms Digital filtering Low pass, high pass, band pass, band reject **Storage** **Storage** Internal: 20 groups. USB: 200 groups Blat file Internal: 20 groups. USB: 200 groups Internal: 20 groups. USB: 200 groups Internal: 20 groups. USB: 200 groups Blat file Internal: 20 groups in BMP format. Blat file Internal: 20 groups in BMP format. Blat file Inte | | Pulse width range: 20ns~10s | |
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| Support standard NTSC and PAL, and the line number scope is respectively 1-525 (NTSC) and 1-625 (PAL) Alter : Edge, Pulse, Slope | Video trigger | | |
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| Math operation +,-, *, + Window Rectangle, Hanning, Blackman, Hamming Vertical scale Vrms, dBVrms Digital filtering Low pass, high pass, band pass, band reject Storage Setting Reference waveform Internal: 20 groups, USB: 200 groups Bitmap USB: 200 groups, USB: 200 groups Bitmap USB: 200 groups, In BMP format. Input Channel Specifications Input Coupling DC, AC and GND Input impedance (IMQ± 2%)//(18pF± 3 pF) Probe attenuation coefficient 0.01×0.02×/0.05×/0.1×/0.2×/0.55×/1×/2×/5×/10×/20√50×/100×/200×/500×/1000× Maximum input voltage 400Vpk, the transient over voltage is 1000 Vpk. Display 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 | | Average value, maximum value, minimum value and standard deviation. | |
| 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 Bitmap USB: 200 groups. USB: 200 groups Bitmap USB: 200 groups. USB: 200 groups Input Channel Specifications Input Coupling Input impedance (IM0 ± 2%)//(18pF ± 3 pF) Probe attenuation coefficient 400Vpk, the transient over voltage is 10000 Vpk. Display stypes Display types LCD with Diagonal of 178mm (7-inch) Display tresolution Bisplay color Color Waveform Luminance Adjustable Backlight intensity (Typical) Adjustable Backlight intensity (Typical) Adjustable Backlight intensity (Typical) Standard configuration Standard uSB Host, USB Device, EXT Trig, Pass/Failt | | | |
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| Maximum input voltage 400 Vpk, the transient over voltage is 1000 Vpk. Display Display stypes LCD with Diagonal of 178mm (7-inch) Display resolution 800 horizontal×RGB× 480 vertical pixels Display color Color Waveform luminance Adjustable Backlight intensity (Typical) 300 nit Language Multi-language Interface function Standard configuration Standard USB Host, USB Device, EXT Trig, Pass/Failt | Inputimpedance | (1MΩ± 2%)//(18pF± 3 pF) | |
| Displays types | 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× | |
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| Waveform luminance Adjustable Backlight intensity (Typical) 300nit Language Multi-language Interface function Standard configuration Standard USB Host, USB Device, EXT Trig, Pass/Failt | Display resolution | 800 horizontal×RGB× 480 vertical pixels | |
| Backlight intensity (Typical) 300nit Language Multi-language Interface function Standard configuration Standard USB Host, USB Device, EXT Trig, Pass/Failt | Display color | Color | |
| Language Multi-language Interface function Standard configuration Standard USB Host, USB Device, EXT Trig, Pass/Failt | Waveform luminance | Adjustable | |
| Interface function Standard configuration Standard USB Host, USB Device, EXT Trig, Pass/Failt | Backlight intensity (Typical) | 300nit | |
| Standard configuration Standard USB Host, USB Device, EXT Trig, Pass/Failt | Language | Multi-language | |
| Stalidard Collingui actori | Interface function | | |
| | Standard configuration | Standard USB Host, USB Device, EXT Trig, Pass/Failt | |
| | otalidard configuration | Option: Multimeter module (UT-M12), LAN | |
| | Standard configuration | | |

| Trigger frequency meter | |
|--------------------------------|---|
| Reading resolution | 6bits |
| Triggersensitivity | |
| 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 | 10 0 VA max |
| Fuse | F1.6A 250V |
| Environment Specifications | |
| Intended use | Indooruse |
| Pollution degree | 2 |
| Operatingtemperature | Operating Temperature Range: 0°C~+40°C |
| Storage Temperature | Storage Temperature Range: -20°C~+60°C |
| Cooling | Build-in cooling fan |
| Operating Humidity Range | <35℃:≤90%RH 35℃~40℃:≤60%RH |
| | Operating 2000 meters below |
| Operating Altitude | 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 Inter | val |
| The recommended calibration in | nterval 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 |
| Powercable | Fits the standard of destination country |
| UT-D14 USB data cable | For UTD2052CL+,UTD2102CL+,UTD2072CL,UTD2152CL |

Warranty

Three-years warranty, excluding probes and accessories.

Please visit https://instruments.uni-trend.com/list_190/65.html to learn more information.

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