

Chapter XIV Technical Information

Except for those specifications marked with “Typical”, all specifications have warranties.

Unless otherwise specified, all technical specifications are applicable to the probes with attenuation switch set as 10× as well as UTD2000 series DSO. DSO must first meet the following two conditions to meet those specification standards:

- The instrument must continuously operate for over half an hour within the operating temperature.
- If the change scope of operating temperature is or exceeds 5°C, please perform the “Self-Adjustment” function in the UTILITY system function.

Basic Specification				
Model	Analog Bandwidth	Rise Time(Typical)	Real-time sampling	Equivalence sampling
UTD2052CL+	50MHz	≤7ns	500MS/s	25GS/s
UTD2072CL	70MHz	≤5ns		
UTD2102CL+	100MHz	≤3.5ns		
UTD2102CL PRO	100MHz	≤3.5ns		
UTD2152CL	150MHz	≤2.4ns		
UTD2052CEX+	50MHz	≤7ns	1GS/s	50GS/s
UTD2102CEX+	100MHz	≤3.5ns		
UTD2152CEX	150MHz	≤2.4ns		
UTD2202CEX	200MHz	≤1.8ns		

Acquire System Specification	
Average	When the sampling times of all channels are N, N can be chosen among 2, 4, 8, 16, 32, 64, 128 and 256

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.

Horizontal System Specification	
Time-base scale	2ns/div-50s/div
Waveform interpolation	Sin(x)/x

Time-base accuracy	$\leq(50+2 \times \text{Service life})\text{ppm}$
Record length	2×512k sampling point
Storage depth	Single channel: 64k; Double channel: 32k
Sampling rate and delay time accuracy	$\pm 50\text{ppm}$ (any time interval $\geq 1\text{ms}$)
Measurement accuracy of time interval (ΔT) (full bandwidth)	Single time: $\pm (1 \text{ sampling time interval} + 50\text{ppm} \times \text{reading} + 0.6\text{ns})$ >16 average values: $\pm (\text{sampling time interval} + 50\text{ppm} \times \text{reading} + 0.4\text{ns})$

Vertical	
Channels	2 Channels
Analog-to-digital converter (A/D)	8bit
Deflection factor range (V/div)	1mV/div~20 V/div(at 1-2-5 increment)
Position range	$\geq \pm 8\text{div}$
Selectable bandwidth limitation (Typical)	20MHz
Low frequency response (AC Coupling, -3dB)	$\leq 5 \text{ Hz}$ (above BNC)
DC gain accuracy (sampling or average sampling mode)	5mV ~20V/div: $\leq \pm 3\%$
	1mV ~2mV/div: $\leq \pm 4\%$
DC measurement accuracy (average sampling mode)	When vertical position is 0 and $N \geq 16$: $\pm (4\% \times \text{reading} + 0.1\text{div} + 1\text{mV})$ and selects 1mV ~2mV/div; $\pm (3\% \times \text{reading} + 0.1\text{div} + 1\text{mV})$ and selects 10mV ~20V/div;
	When vertical position is not 0 and $N \geq 16$: $\pm (3\% \times (\text{reading} + \text{vertical position reading}) + (1\% \times \text{vertical position reading})) + 0.2\text{div}$ The setting from 5mV/div to 200mV/div plus 2mV; the setting value from 200mV/div to 20V/div plus 50mV
Measurement accuracy of voltage difference (ΔV) (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: $\pm (3\% \times \text{reading} + 0.05\text{div})$

Trigger System Specifications	
Trigger sensitivity	$\leq 1\text{div}$
Range of trigger level	Interior: From the screen center $\pm 10\text{div}$
	EXT: $\pm 3\text{V}$
Trigger level accuracy (Typical) applicable for the signal with rising and falling	Interior: $\pm (0.3\text{div} \times \text{V/div})$ (within $\pm 4 \text{ div}$ from the screen center)
	EXT: $\pm (6\% \text{ setting value} + 40\text{mV})$

time $\geq 20\text{ns}$	
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 $\geq 50\text{Hz}$
Trigger mode	AUTO, normal, single
High-frequency holdoff	Hold off signals over 80kHz
Low-frequency holdoff	Hold off signals below 80kHz
Edge trigger	
Edge	Rise, fall, rise&fall
Pulse width trigger	
Trigger mode	>, <, <>
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 setting	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) ($1/\Delta T$)	
	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	V _{rms} , dBV _{rms}
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.

Trigger frequency meter	
Reading resolution	6 bits
Trigger sensitivity	≤30V _{rms}
Accuracy (Typical)	±51ppm (+1 character)

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	Chinese and English

Interface function:	
Standard configuration	Standard: USB-Host, USB-Device, EXT Trig, Pass/Fault. Option: Multimeter module (UT-M12), LAN.

General Technical Specification	
Probe compensator output	
Output voltage (Typical)	About 3V _{pp} , when the load≥1MΩ

Frequency (Typical)	10Hz,100Hz, 1kHz(Default), 10kHz
Power Source	
Power voltage	100V-240V~(Fluctuations $\pm 10\%$), 50/60Hz
Power consumption	100VA max
Fuse	F 1.6A, 250V
Environment Specifications	
Intended use	Indoor use
Pollution degree	2
Operating temperature	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°C: $\leq 90\%$ RH 35°C~40°C: $\leq 60\%$ RH
Operating Altitude	Operating: 2000 meters below Non-operating: 15000 meters below
Mechanical specifications	
Size	306mm(W)×138mm(H)×124mm(D)
Weight	Excluding package: 2.5kg Including package: 3kg
Recommended calibration Interval	
The recommended calibration interval is one year.	

Chapter XV Appendix

Appendix A Accessories

Model	UTD2052CL+ (50 MHz)
	UTD2052CL+ (50 MHz)
	UTD2072CL (70 MHz)
	UTD2102CL+ (100 MHz)
	UTD2152CL (150 MHz)
	UTD2052CEX+ (50 MHz)
	UTD2102CEX+ (100 MHz)
	UTD2202CEX+ (200 MHz)
Standard accessories	A string of power cord complying with country standard.
	A string of USB cable (UT-D14)
	A pair of passive probe (60MHz) /(150MHz) /(200MHz)
Optional accessories	Multimeter module (UT-M12)

Appendix B Maintenance and Cleaning

(1) General Maintenance

Please do not store or place the instrument at any places where the LCD of the instrument is exposed to sunlight directly.

Caution: Please do not stain the instrument or probe with spray, liquid or solvent, so as to avoid damaging the instrument or probe.

(2) Clearing

Check the instrument and probe frequently. Clean the surface of the instrument according to the following steps:

- ① Please wipe the surface of the instrument and probe with soft cloth. Pay attention not to scratch the LCD screen.
- ② Wipe the instrument with wet cloth after disconnecting the power supply. Use detergent or clear water to clean. Do not use any abrasive chemical cleaning agent so as to avoid damaging the instrument or probe.

Warnings: Please make sure that the instrument is completely dry before powering on again, to avoid electrical short circuit or injury.

Appendix C Warranty

UNI-T (Uni-Trend Technology (China) Co., Ltd.) warrants that product produced and marketed by it will be free from defects in materials and workmanship for a period of three years from the date of shipment by the authorized dealer. If any such product proves defective during this warranty period, UNI-T will repair the defective product or provide a

replacement according to specific terms and conditions of the warranty. To request maintenance and repair service or a full copy of the warranty, please contact your nearest UNI-T sales and maintenance office.

Save and except the guarantee given herein or in other applicable warranty, UNI-T makes no other express or implied guarantee, including but not limited to any implied guarantee on the product's tradability and suitability for any specific purpose. Under no circumstance will UNI-T bear any liability for any indirect, special or subsequent loss.

Appendix D Contact Us

For product support outside China, contact your local UNI-T supplier or sales centre.

Service Support: Many UNI-T products offer optional plans of extended warranty period or calibration period. For details please contact your local UNI-T supplier or sales centre.

UNI-T®**UNI-TREND TECHNOLOGY (CHINA) CO., LTD.**

No6, Gong Ye Bei 1st Road,
Songshan Lake National High-Tech Industrial
Development Zone, Dongguan City,
Guangdong Province, China
Tel: (86-769) 8572 3888
<http://www.uni-trend.com>