Chapter 14 Technical Index

Aside from specification labeled "typical", all specifications are guaranteed.

Unless otherwise stated, all technical specifications are applicable to probe attenuation 10X and with UPO2000CS series oscilloscope. Oscilloscope must first meet the following two conditions in order to achieve these standards:

- The instrument must be operated at the specified operating temperature for more than thirty minutes.
- If the operating temperature exceeds 5 degrees Celsius from normal operating temperature, self calibration needs to be performed.

Input	
Input Coupling	DC, AC, GND
Input Impedance	1MΩ ± 2% // 20pF ± 3pF
Probe Attenuation Coefficient	0.001×，0.01×，0.1×，1×，10×，100×，1000×
Maximum Input Voltage	CATI 300 Vrms，CATII 100 Vrms，Transient Overvoltage 1000 Vpk

Vertical					
Model	UPO2104CS	UPO2074CS	UPO2102CS	UPO2072CS	UPO2202CS
Bandwidth	100MHz	70MHz	100 MHz	70MHz	200MHz
Rise Time (Typical)	≤3.5ns	≤5ns	≤3.5ns	≤5ns	≤1.8ns
Channels	4		2		
Vertical Resolution	8bit				
Vertical Scale	1mV/div~20 V/div(1-2-5 base)				
Vertical Displacement Range	1mV/div~50 mV/div：±2V 100 mV/div~1 V/div：±40V 2V/div~20 V/div：±400V				
Bandwidth Limit (typical)	20MHz				
Low Frequency Response (AC coupling, -3dB)	≤5 Hz（on BNC）				
DC Gain Accuracy	≤±3% (Sampling or average sampling method)				
DC Offset accuracy	≤±4% (Sampling or average sampling method)				
Channel Separation	DC to maximum bandwidth：>40 dB				
Horizontal					
Timing Scale	5ns/div ~ 50s/div (1-2-5 base) 2ns/div ~ 50s/div (1-2-5 base)（UPO2202CS）				

Timing Accuracy	≤±(50+ 2×Service Life)ppm
Delay	Pre-trigger（Negative Delay）：≥1 Screen Width Post-trigger（Positive Delay）：1 s~50 s
Timebase	YT、XY、ROLL
Waveform Capture Rate	50,000 wfms/s

Sampling	
Sampling Mode	Teal-time Sampling
Real-time Sampling Rate	1GS/s(Single Channel)，500MS/s(Dual Channel)，250MS/s(Quad Channel) 1GS/s(Single Channel)，500MS/s(Dual Channel)(UPO2202CS)
Acquisition Mode	Sampling, peak detection, high resolution, envelope, and average
Average Value	After all channels reach N times sampling, N times in 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, and 8192
Waveform Interpolation	sin(x)/x
Storage Depth	Auto, 28kpts, 280kpts, 2.8Mpts, 28Mpts

Trigger	
Trigger Level Range	Internal：Center of the screen ± 8 grids External：± 0.8V
Trigger Mode	Automatic, normal, single
Trigger Holdoff Range	100ns~10s
High Frequency Suppression	50kHz
Low Frequency Suppression	5kHz
Noise Suppression	Reduce Noise Waveform（10 mV/div～20 V/div，DC coupling trigger sensitivity reduced by 2 times）
Trigger Sensitivity	≤1div
Edge Trigger	
Edge Type	Rising, falling, any
Pulse Width Trigger	
Pulse Condition	>、<、=
Polarity	Positive, negative pulse width
Pulse Width Range	4ns ~ 10s
Under-range Pulse Trigger	

Pulse Condition	>、<、=
Polarity	Positive, negative
Pulse Width Range	8ns~10s
Beyond-range Pulse Trigger	
Beyond-range type	Rising, falling, any
Trigger Position	Entering, exiting, time
Beyond-range time	8ns~10s
N-edge Trigger	
Edge Type	Rising, falling
Free Time	8ns~10s
Edge Count	1~65535
Delay Trigger	
Edge Type	Rising, falling
Delay Type	Greater than, less than, within scope, outside scope
Delay Time	Normal：8ns~10s Time lower limit：8ns~10s Time upper limit：36ns~10s
Overtime Trigger	
Edge Type	Rising, falling, any
Timeout	8ns~10s
Duration Trigger	
Pattern Type	H, L, X
Trigger Condition	Greater than, less than, within range
Duration Time	Normal：8ns~10s Time lower limit：8ns~10s Time upper limit：36ns~10s
Setup/hold Trigger	
Edge Type	Rising, falling
Data Type	H, L
Setup Time	8ns~10s
Hold Time	8ns~10s
Slope Trigger	
Slope Condition	Positive slope (greater than, less than, specified range) Negative slope (greater than, less than, specified range)

Time Setup	8ns~10s	
Video Trigger		
Signal System Frequency Range	Supports NTSC, PAL, and SECAM systems，rows range is 1~525 (NTSC) and 1~625 (PAL/SECAM)	
Code Type Trigger		
Code Set	H, L, X, rising, falling	
Measure		
Cursor	Manual	Voltage between cursors（ΔV） Time between cursors（ΔT） Frequency（Hz）（1/ΔT）
	Trace Mode	Voltage and time at waveform point
	Indicator	Allows auto display of cursor
Auto Measurement	Max, Min, Peak-Peak, Top, Bottom, Amplitude, Mean, Middle, Peroid Mean, RMS, Period RMS, Area, Period Area, Overshoot, Preshoot, Frequency, Period, Rise Time, Fall Time, Positive Pulse, Negative Pulse, Positive Duty Ratio, Negative Duty Ratio, Delay A->B , Delay A->B , Dela B->A , Delay B->A .	
Measurement Number	Displays 5 at the same time	
Measurement Range	Screen or cursor	
Measurement Statistics	Average value, maximum value, minimum value, standard deviation and the number of measurements	
Frequency meter	6-bit	

Mathematical Operations	
Waveform Calculation	A+B, A-B, A×B, A/B, FFT, Logic Operation
FFT Window Type	Rectangle, Hanning, Blackman, Hamming
FFT Display	Split screen; time base files can be adjusted independently
FFT Vertical Scale	Vrms, dBVrms
Digital Filter	Low pass, high pass, band pass
Logical operation	AND, OR, NOT, XOR

Storage	
Setting	Internal (256), External USB
Waveform	Internal (256), External USB
Bitmap	External USB

Display	
Display	8-inch TFT LCD
Display Resolution	800 horizontal ×480 vertical (RGB)
Display Color	160,000,000
Duration	Min, 100ms, 200ms, 500ms, 1s, 2s, 5s, 10s, unlimited
Menu Duration	1s, 2s, 5s, 10s, 20s, manual
Display Type	Point, vector

Interface	
Standard/Optional	Standard：USB-Host, USB-Device, LAN, EXT Trig, AUX Out Optional：Waveform Genrator

General Technical Specifications	
Probe compensated signal output	
Output Voltage	3Vp-p
Frequency	10Hz, 100Hz, 1kHz(default), 10kHz
Power Supply	
Power Supply Voltage	100V～240VACrms
Frequency	45Hz～440Hz
Fuse	3A，T level，250V
Environment	
Temperature Range	Operational：0℃～+40℃
	Non-Operational：-20℃～+60℃
Cooling	Forced cooling fan
Humidity range	Operational：below +35℃ ≤90％Relative humidity Non-operational：+35℃～+40℃ ≤60％Relative humidity
Altitude	Operational：Below 3000m；Non-operational：Below 15,000m
Mechanical Specifications	
Size	336mm(W)×164mm(H)×108(D)mm
Weight	3.5kg
Maintenance Period	
Recommend to perform calibration once a year	

Chapter 15 Accessories

Appendix A – Accessories and Options

Model Numbers	UPO2072CS/UPO2074CS(70 MHz)/UPO2202CS(200MHz)
	UPO2102CS/UPO2104CS(100 MHz)
Standard Accessories	Power line meets local country standard
	USB data cable (UT-D06)
	2/4 passive probes (100MHz)
	Quick guide
	CD (Includes manual and application software)

For all accessories (standard and optional), please order at UNI-T local dealers.

Appendix B – Maintenance and Cleaning

(1) General Maintenance

Do not store or place the instrument and liquid crystal display in direct sunlight. **Caution:** do not spray liquid or solvent on the instrument or probe.

(2) Clean

Refer to the operating conditions of the instrument and probe and perform frequent checks. Clean the outer surface of the instrument according to the following steps:

Please use a soft cloth to wipe the dust off probes and the instrument.

When cleaning the LCD screen, please pay attention and protect the LCD screen.

Please disconnect the power supply, then with a damp but not dripping soft cloth, wipe the instrument.

Do not use any chemical abrasive cleaning agent on the instrument or probes.

Warning: Please confirm that the instrument is completely dry before use, to avoid damage caused by electrical short circuit caused by moisture.

Appendix C – Warranty Overview

Uni-T (Uni-Trend Technology (China) Ltd.) ensures the production and sale of products, from authorized dealer's delivery date of three years, without any defects in materials and workmanship. If the product is proven to be defective within this period, UNI-T will repaire or replace the product in accordance with the detailed provisions of the warranty.

To arrange for repair or acquire warranty form, please contact the nearest UNI-T sales and repair department.

In addition to permit provided by this summary or other applicable insurance guarantee, Uni-T does not provide any other explicit or implied guarantee, including but not limited to the product trading and special purpose for any implied warranties. In any case, UNI-T for indirect, special, or consequential loss does not bear any responsibility.