Digital Storage Oscilloscope

4 CH 500MHz, 2GSa/S, 2Gpts Memory Depth

Up to 500,000 wfms/s, with 1CH AWG

DPO7504U

Accessories

- ✓ 4pcs Passive Probes

- ✓ 1pc USB Cable

- ✓ 1pc Power Supply

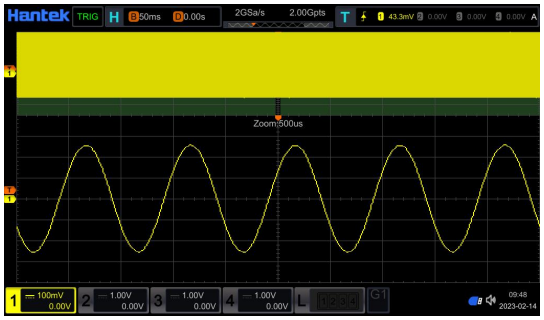
Features

5 in 1 Instrument: 4CH Oscilloscope, 1CH Waveform Generator, Spectrum Analyzer, Digital Voltmeter, Frequency Counter

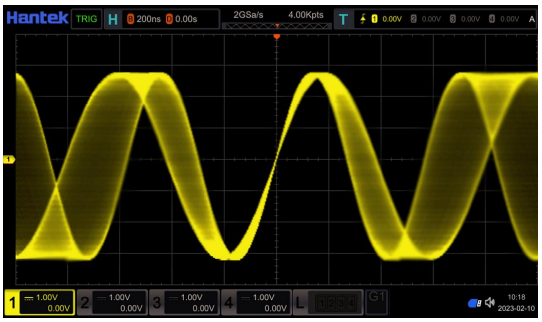
- 4 analog channels, 500MHz bandwidth, and 1 EXT channel.
- Up to 2GS/s sample rate, Max. 2Gpts memory depth.
- Waveform capture rate up to 500,000 wfms/s.
- Low noise, vertical minimum range 500μV/div.
- 51 auto measurements and a statistics display.
- 20 basic math and advanced math functions, including FFT standard.
- With zone trigger function.
- Reference waveform for comparing with other channel or math waveforms.
- Analysis features including counter, digital voltmeter (DVM)
- With Search, Zoom, Navigate, Pass/Fail, Waveform Recorder function.
- 5-digit digital voltmeter (DVM) and 6-digit counter with totalizer.
- Built-in 1 channel, 25MHz waveform generator with: sine, square, ramp, noise, pulse, DC, sine cardinal, exponential fall, haversine, lorentz, dual tone, gause, ECG, arbitrary.
- Standard USB Host, USB Device (Type C), and LAN port.
- Large (10.1-inch) capacitive touchscreen, 256 level intensity grading display, color persistence.
- Supports SCPI remote command control.

Benefits

Up to 2G memory depth

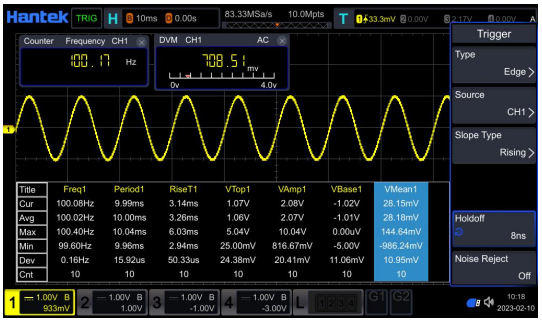


256 grade color display

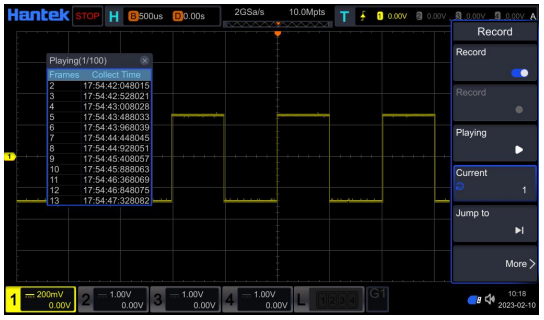


Zone Trigger

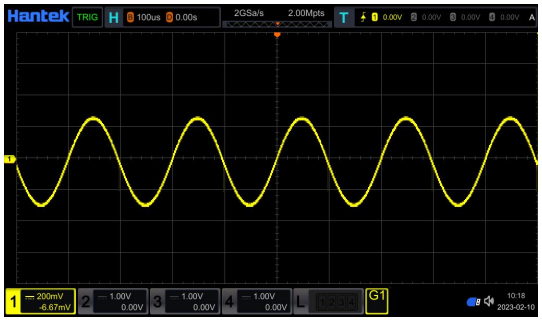
DVM, Counter and Totalizer



Waveform recording and playback



Max. frequency 25MHz Waveform Generator



Specification

Model	DPO7504U
Overview	
Analog Bandwidth (-3 dB)	500MHz
Rise Time at BNC (typical)	≤700ps
Analog Channel	4
Max. Sample Rate	2GSa/s for single channels 1GSa/s for half or all channels
Max. Memory Depth	2Gpts for single channel 1Gpts for half channels 500Mpts for three or all channels
Display Type	10.1 inch capacitive multitouch screen
Display Resolution	1024 horizontal by 600 vertical pixels
Waveform Update Rate (Typical)	Up to 500,000 wfms/s (at 25ns, single channel, auto memory depth)
External Trigger	1
Waveform Color Persistence	Standard
Counter	6-digit frequency counter + totalizer
Integrated Digital Voltmeter	Standard
Waveform Recorder	Standard
Search and Navigation	Standard (supporting table display)
Hardware Mask Test	Standard
Built-in Waveform Generator	1CH, 25MHz
FFT	Standard
MATH	Displays 4 functions simultaneously
Connectivity	USB Host, USB Device (Type C), LAN
OSCILLOSCOPE	
Vertical	
Input Coupling	AC, DC, GND
Input Impedance/Capacitance	1MΩ±1%, 50Ω±1% / 19pF±3pF
Probe Attenuation Coefficient	0.01X, 0.02X, 0.05X, 0.1X, 0.2X, 0.5X, 1X, 2X, 5X, 10X, 20X, 50X, 100X, 200X, 500X, 1000X, 2000X, 5000X, 10000X, 20000X, and 50000X
Vertical Resolution	8-bit
Max. Input Voltage	CAT I 300V_{RMS}, 400Vpk, transient overvoltage 1600Vpk in 1MΩ 5V_{RMS} in 50Ω
Input Sensitivity Range	500μV/div to 10V/div in 1MΩ 500μV/div to 1V/div in 50Ω

Offset Range	1MΩ	50Ω
	±1V (500μV/div to 50mV/div) ±10V (100mV/div to 500mV/div) ±100V (1V/div to 10V/div)	±1V (500μV/div to 50mV/div) ±10V (100mV/div to 500mV/div) ±100V (1V/div)
Bandwidth Limits	20MHz, 100MHz, 200MHz, 350MHz (selectable for each channel)	

Dynamic Range	±5 div (8 bit)
Channel to Channel Isolation	40dB from DC to the maximum specified bandwidth
DC Gain Accuracy	±3% of full scale
DC Offset Accuracy	<200 mV/div (±0.1div ± 2mV ± 1.5% offset setting) >200 mV/div (±0.1div ± 2mV ± 1.0% offset setting)
ESD Tolerance	±8 kV (at input BNC)

Horizontal

Time Base Range	500ps/div to 1ks/div	
Time Accuracy	±1ppm ±1ppm per year	
Time Base Delay Time Range	Pre-Trigger	Post-Trigger
	Greater of 1/2 screen width	1 s or 100 div (take the bigger value)
Delta Time Accuracy (using cursors)	± (1 sample interval) ± (2ppm × reading) ± 50ps	
Channel to Chanel Deskew Range	± 100 ns	
Modes	YT	Default mode
	XY	X1 = channel 1, Y1 = channel 2 Displays the volts vs volts display
	SCAN	Available at the timebase settings of 100 ms/div or slower
	ROLL	Available at the timebase settings of 100 ms/div or slower

Acquisition

Max. Sample Rate	2GSa/s for half channels 1GSa/s for all channels
Max. Record Length	2Gpts for single channel 1Gpts for half channels 500Mpts for three or all channels

Acquisition Mode	Normal	Default
	Peak Detect	Capture glitches as narrow as 1ns at all time base settings
	Average	Selectable from 2, 4, 8, 16, ... to 65536
	High Resolution	Max. 12 bits

Trigger

Trigger Source	CH1, CH2, CH3, CH4, EXT
Trigger Modes	Normal (triggered): requires trigger event for scope to trigger Auto: Triggers automatically in absence of trigger event Single: Triggers only once on a trigger event, press **Single** again for scope to find another trigger event, or press **Run** to trigger continuously in either Auto or Normal mode Force: front panel key that forces a trigger
Trigger Holdoff Range	8ns to 10s
Trigger Bandwidth	Analog bandwidth
Trigger Sensitivity	< 10 mV/div: greater of 1 div or 5mV ≥ 10 mV/div: 0.5 div Trigger sensitivity reducing half by turning on the noise rejection
Trigger Level Range	± 4 div from center screen
Zone Trigger (HW zone qualifier)	Trigger on user-defined zones drawn on the display. Applies to one analog channel at a time. Specify zones as either “must intersect” or “must not intersect.” Up to two zones.
Trigger Types	Standard: Edge, Pulse, Video, Slope, Overtime, Window, Runt, OverAmp, Pattern, Delay, Setup/Hold
Edge	Trigger on a rising, falling, or either edge of any source
Pulse	Trigger on a pulse of a selected channel with a time duration that is ‘less than a value,’ ‘greater than a value’ , ‘equal to a value’ or ‘not equal to a value’ Range: 8ns to 10s
Video	Trigger on scan lines or individual lines; odd/even or all fields from the composite video; or broadcast standards (PAL/SECAM and NTSC)
Slope	Trigger on rising or falling slope of the specified time. This trigger mode is applicable to ramp and triangle waveforms.
Overtime	Trigger when the time interval is greater than the pre-set timeout value.
Window	Trigger when the input signal passes through the high trigger level or the low trigger level.
Runt	Trigger when the pulses pass through one threshold but fail to pass through another threshold. The channel only supports analog channels.
Over Amp	Trigger when the input signal is higher than the high trigger level, or lower than the lower trigger level.
Pattern	Trigger when a specified pattern of rising, falling, either, high, low, and don’t care levels of any combination of analog channel source.
Delay	Trigger when the time difference between the specified edges of Source A and Source B meets the preset time. The duration is greater or smaller than a certain value, or within a certain time range, or outside a certain time range.
Setup/Hold	Trigger and clock/data setup and/or hold time violation.

Search and Navigation

Type	Edge, Pulse, Runt, Slope	
Source	Any analog channel	
Copy	Copy the search settings to the trigger settings, and copy from the trigger settings	
Result Display	Event table or navigation. Go to the specific event through the event table index	
Navigation	Memory playing	Scroll through stored waveform data to view the memory waveforms with the navigation keys.
	Zoom playing	Pan the Zoom Window automatically to view the details of waveforms with the navigation keys.
	Recording playback	Use the navigation keys to play back the recorded waveforms.
	Event navigation	Use the navigation keys to scroll through the event search results.

Measurements

Cursors	Number of Cursors	2 pairs of XY cursors
	Manual Mode	Voltage difference between cursors (△Y) Time difference between cursors (△X) Reciprocal of △X in Hertz (1/ΔX)
	Track Mode	Fix Y axis to track the voltage and time values of X axis waveform point Fix X axis to track the voltage and time values of Y axis waveform point
Auto Measurements	Measurement continuously updated with statistics. Select up to 7 measurements from the list below: Time: Frequency, Period, Rise Time, Fall Time, + Width, - Width, +Duty, -Duty, BWidth, MaxTime, MinTime, +Edges, +Edges, +Pulses, -Pulses, TrigCunt, +Slope, -Slope Voltage: Peak to peak, Average, Maximum, Minimum, Vtop, Vmid, Vbase, Vamp, RMS, R-Overshoot, F-Preshoot, Preiod RMS, Preiod Average, F-Overshoot, R-Preshoot Other: FRR, FFF, FRF, FFR, LRR, LRF, LFR, LFF, +Phase, -Phase, +Area DC, -Area DC, perAreaDC, absAreaDC, +AreaAC, -AreaAC, perAreaAC, absAreaAC	

Waveform Math

Arithmetic	A+B, A-B, A*B, A/B, FFT, A&&B, A||B, A^B, !A, Intg, Diff, Sqrt, Lg, Ln, Exp, Abs, LowPass, HighPass, BandPass, BandStop, AX+B, Expression
FFT	Window types: Hanning, Hamming, Flattop, Rectangular, Triangle, Blackman Peak search: Max 15 peaks

DVM (DIGITAL VOLTMETER)

Functions		AC RMS, AC+DC RMS, DC
Data Source	CH1, CH2, CH3, CH4	
Resolution	3 digits	

FREQUENCY COUNTER

Measurement	Frequency, period, totalize
Data Source	CH1, CH2, CH3, CH4
Resolution	5 digits

BUILT-IN ARBITRARY/FUNCTION GENERATOR

WaveGen Out	1CH rear-panel BNC connector		
Waveform	Sine, Square, Ramp, Pulse, DC, Noise, Sinc, Exp.Rise (exponential rise), Exp.Fall (exponential fall), ECG, Gauss, Lorentz, Haversine, Arbitrary.		
Modulation	Modulation Type	AM	Modulation Frequency: 1Hz to 50kHz Depth: 0 to 120%
		FM	Modulation Frequency: 1Hz to 50kHz Deviation: 0.1Hz to 1.01kHz
		PM	Modulation Frequency: 1Hz to 50kHz Depth: 0 to 120%
	Carrier Wave	Sine, ramp	
	Modulation	Sine, square, ramp, noise	
Burst	Types	N Cycle, Infinite	
	Count	1 to 10	
	Trigger Source	Internal, Manual	
	Burst Period	2ms to 500s	
Frequency	Sine: 0.1Hz to 25MHz Square/Pulse/Arb: 0.1Hz to 10MHz Ramp/Sinc/ECG/Gauss/Lorentz/Haversine: 0.1Hz to 1MHz Exp.Rise/Exp.Fall: 0.1Hz to 5MHz		
Sample Rate	200MSa/s		
Output Impedance	50 Ω + 1%		
Amplitude	5mVpp to 2.5Vpp (50Ω) 10mVpp to 5Vpp (High impedance)		
Frequency Resolution	100mHz or 4bits whichever is greater		
Waveform Depth	2KSa		
Vertical Resolution	12 bits		
Frequency Accuracy	100ppm (frequency <10KHz) 50ppm (frequency >10KHz)		
DC Offset	Range	±2.5V (HighZ) ±1.25V (50Ω)	
	Resolution	100μV or 3bits whichever is greater	
	Accuracy	2% (1kHz)	

Display

Display Type		10.1 inch multitouch capacitive screen
Display Resolution		1024 horizontal by 600 vertical pixels

Connectivity

Standard Ports		USB device, USB host, LAN

Probe Compensator Output

Output Voltage (typical)		About 5V into ≥1MΩ load
Frequency (typical)		1kHz ± 1%

Power Supply

Supply Voltage		100-120VACRMS(±10%), 50Hz/60Hz/400Hz 120-240VACRMS(±10%), 50Hz/60Hz/400Hz
Power Consumption		Max. 50W
Fuse		T4A 250VAC

Environmental

Temperature	Operating	0℃ to 50℃
	Storage	-30℃ to +70℃
Humidity	Operating	+30℃ or below: ≤90% relative humidity; +30℃ to +40℃: ≤75% relative humidity; +40℃ to +50℃): ≤45% relative humidity
	Storage	Below +65℃: ≤90% relative humidity;
Altitude	Operating	Below 3,000m
	Storage	Below 15,000m

Mechanical

Dimension		372 x 138 x 232mm (L x W x H)
Weight		4.0KG