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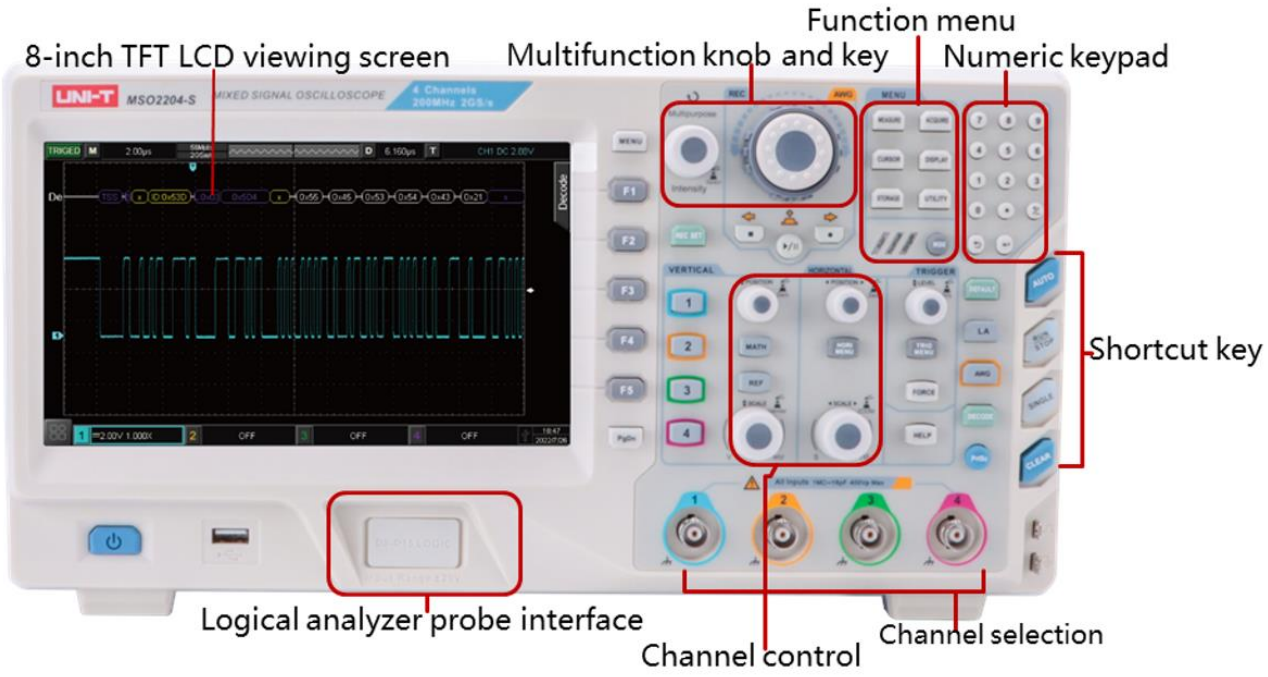
Datasheet

MSO/UPO2000 Series Digital Oscilloscope

Main Features

- Analog channel bandwidth: 200MHz, 100MHz
- Real time sampling rate of analog channel 2GSa/s
- Real time sampling rate of digital channel 1GSa/s (only MSO)
- Number of analog channels: 2 or 4
- Storage depth of each channel: 56Mpts
- 16 digital channels, storage depth 56Mpts (only MSO)
- Waveform capture rate up to 1,000,000 wfms/s
- Built in 50MHz dual channel function / arbitrary waveform generator (only MSO-S). It supports real-time loading of oscilloscope screen data to AWG arbitrary wave output.
- Support Bode Plot loop test and analysis function
- Hardware real-time waveform uninterrupted recording and analysis up to 120,000 frames
- Waveform operation functions (+, −, ×, ÷, digital filtering, logic operation and advanced operation)
- 4M points enhanced FFT, supporting frequency setting, waterfall diagram, detection setting and mark measurement, etc.
- Auto measurement of 36 waveform parameters
- Multi-Scopes supports multi-channel independent trigger and fluorescent display
- Multi-channel independent 7-bit hardware frequency counter
- DVM supports multi-channel independent AC / DC true RMS measurement
- Rich trigger functions: edge, pulse, video, slope, runt, over amplitude pulse, delay, timeout, duration, setup/hold, Nth edge and pattern trigger
- Area trigger function, which can be used to capture accidental signals and observe complex signals
- Protocol trigger and decoding function (optional)：RS232, I2C, SPI, CAN, CAN-FD, LIN, FlexRay
- Ultra Phosphor super fluorescent display effect, up to 256 levels of gray display
- 8-inch 800×480 capacitive touch, supporting various gesture operations: click, slide, zoom, edit, drag, etc.
- Rich interfaces: USB Host, USB Device, LAN, EXT Trig, AUX Out (Trig Out、Pass/Fail), AWG, VGA
- Support SCPI programmable instrument standard commands
- Support web access and control

Panel Structure

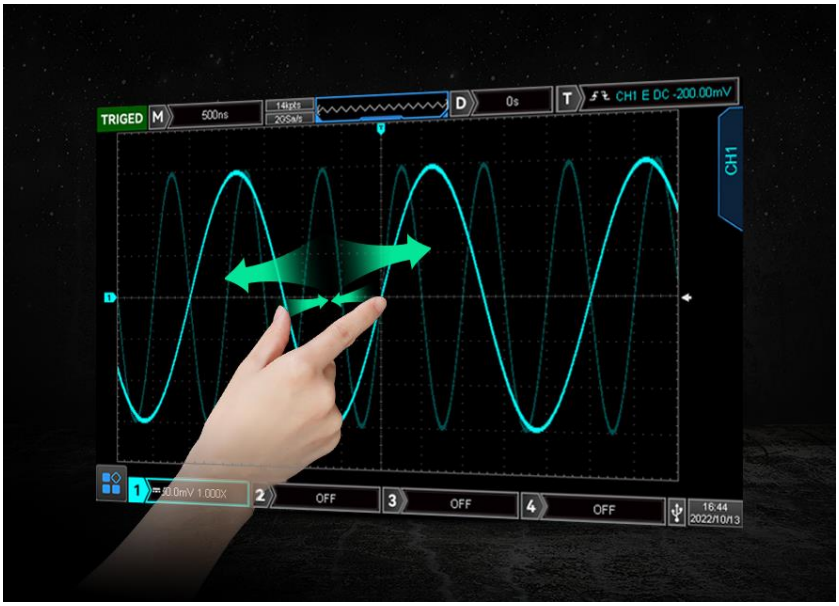


Product Introduction

The MSO/UPO2000 series digital phosphor oscilloscope is a multifunctional and high-performance oscilloscope based on UNI-T's original Ultra Phosphor technology. It realizes the combination of ease of use, excellent technical indicators and many functional features. It can help users complete the measurement work faster. It is an oscilloscope designed for general design / debugging / testing needs in many fields, such as communication, semiconductor, computer, instrumentation, industrial electronics, consumer electronics, automotive electronics, on-site maintenance, R & D / education, etc. Fast Acquire technology can accurately capture abnormal events such as video, jitter, noise and low wave signals.

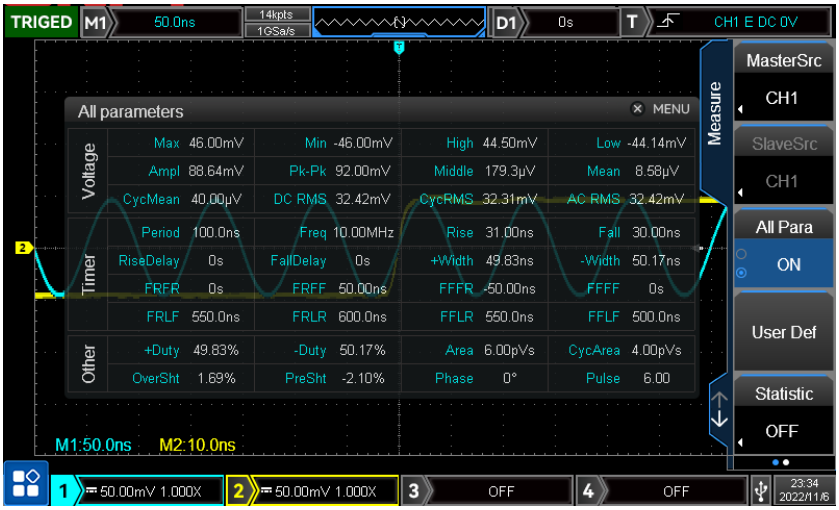
Brand new interactive experience

The 8-inch touch screen design supports a variety of gesture operations, such as click, slide, zoom, edit, drag, etc. Make the measurement action smoother and more convenient, and users can master it more quickly. At the same time, the traditional button and knob operation is still retained, and the interactive experience is optimized to the greatest extent.



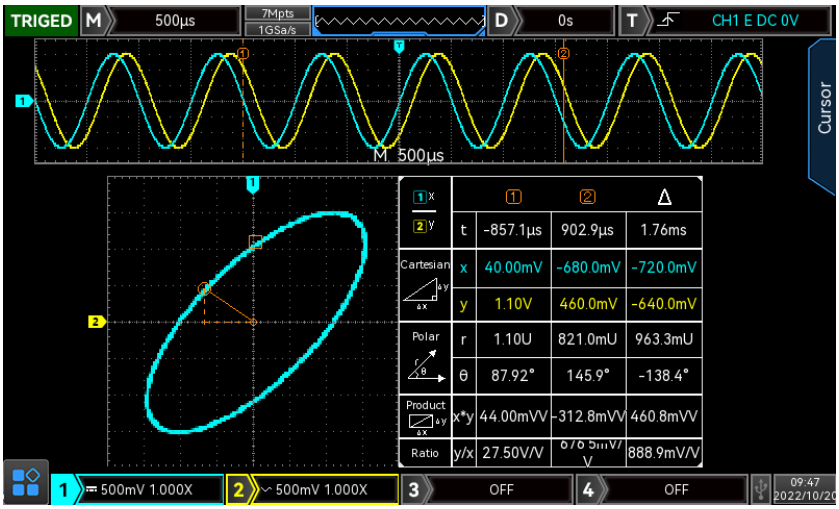
Rich measurement functions

Automatic parameter measurement up to 36 kinds. Provides a variety of automatic measurement parameters while you measure waveforms, greatly improving your measurement efficiency.



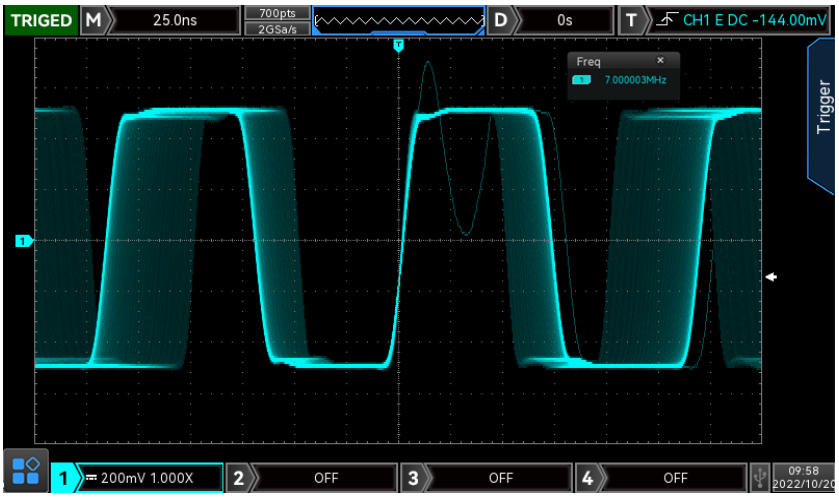
XY mode

XY mode cursor measurement can quickly measure the phase difference between two signals.



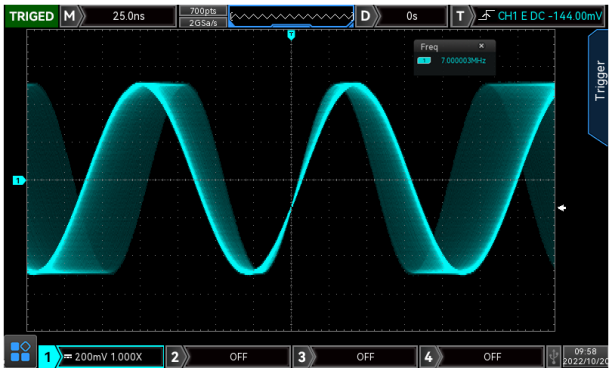
Ultra high capture rate

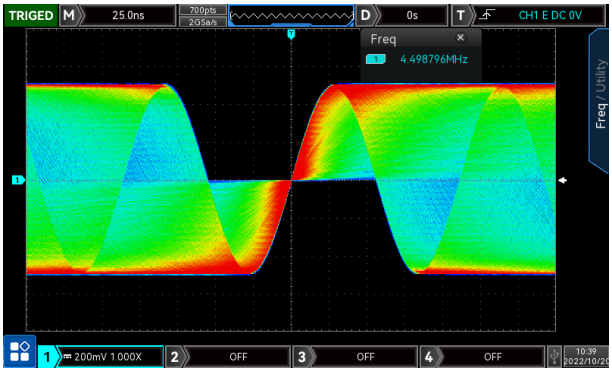
Using innovative digital signal parallel processing technology, it can reach an ultra-high capture rate of 200,000wfms/s in normal sampling and 1,000,000 wfms/s in Fast Acquire mode. Efficient capture of occasional signals.



256-level grayscale display

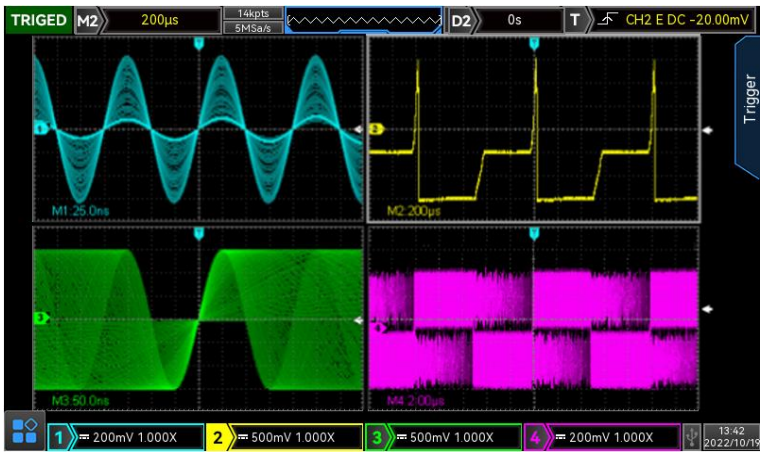
Using the original Ultra Phosphor display technology, you can observe the accumulated effect for a long time, which is convenient for displaying waveform details and occasional abnormalities.





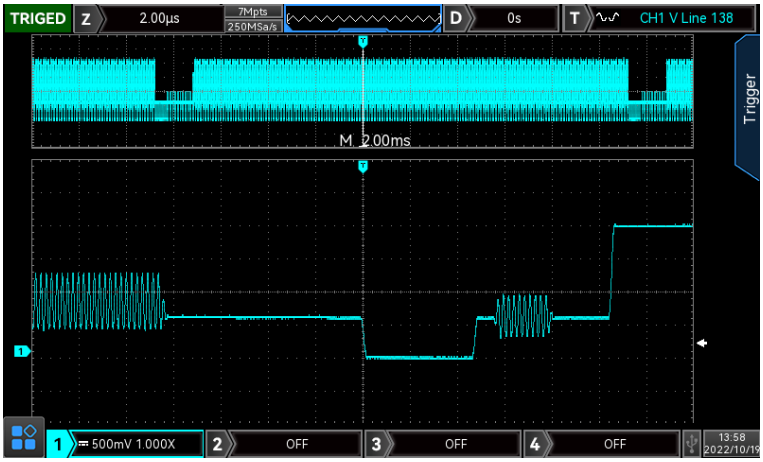
Channel split screen function

Using the original Multi-Scopes technology, the waveform display is more user-friendly, which is convenient for users to experience and analyze waveform details.



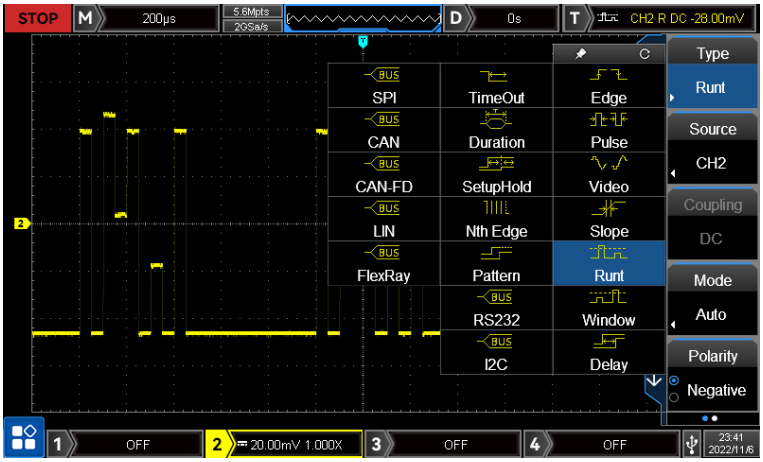
Memory depth 56Mpts per channel

The oscilloscope can maintain a high sampling rate in a wider time base range, while taking into account the overall and details of the waveform, greatly improving the capture rate of abnormal waveforms.



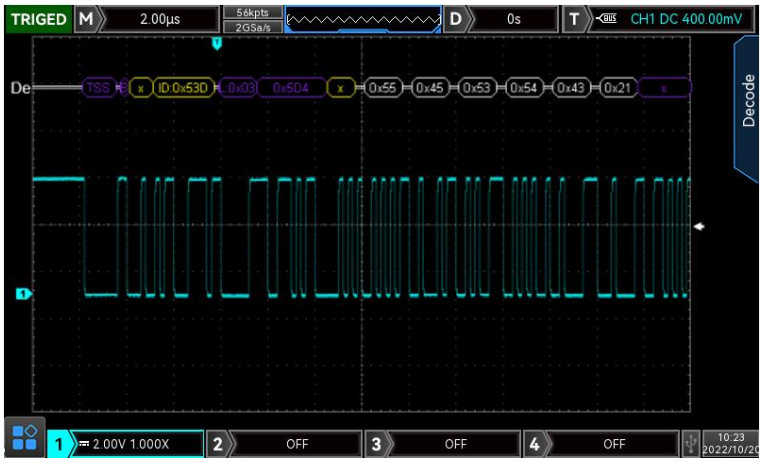
Rich trigger function

With a wealth of advanced trigger and bus trigger functions, it can help users accurately and quickly capture and display the signal of interest.



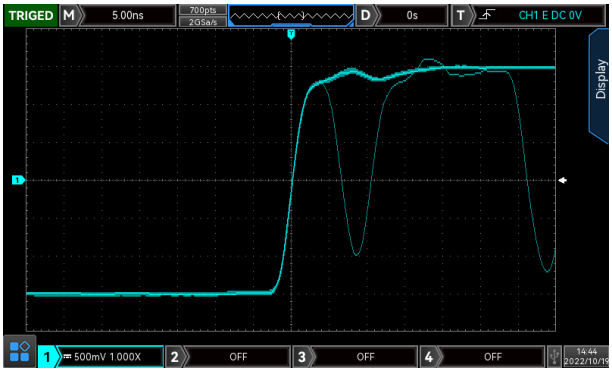
Full memory hardware decoding

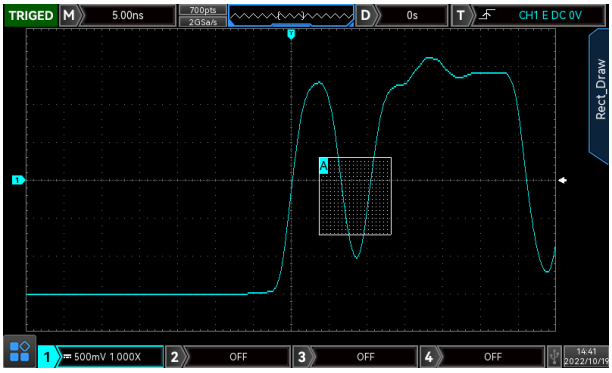
The decoding speed is greatly improved. The full-memory hardware decoding under the deep storage of 56Mpts, the decoding time is increased from more than ten seconds to milliseconds, which realizes real-time decoding and greatly improves the user's problem diagnosis efficiency.
The recorded waveform also supports full-memory hardware real-time decoding.



Area trigger

The area trigger can be used in combination with the existing basic trigger, advanced trigger and protocol trigger to complete the capture of various occasional and complex characteristic signals.



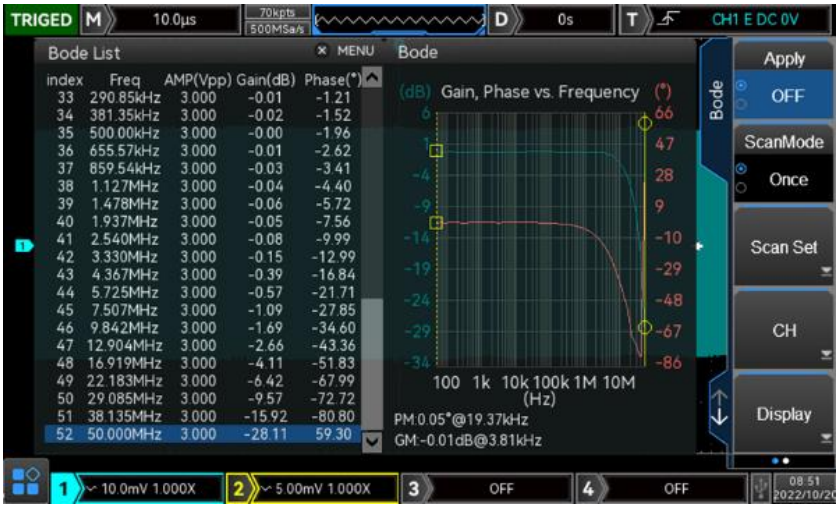


AWG Function Arbitrary Waveform Generator

The built-in dual-channel function arbitrary waveform generator can output sine wave, square wave, ramp wave, pulse wave, arbitrary wave, noise and DC. The maximum frequency output of sine wave is 50MHz.

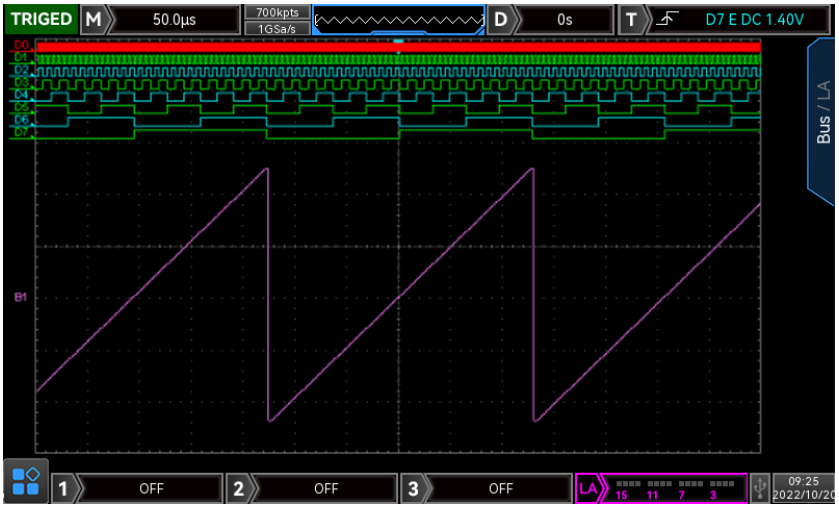
Bode plot

Can be used for loop analysis. It is a critical measurement often used to characterize the frequency response (gain, phase, and frequency) of today's various electronic designs, including passive filters, amplifier circuits, and negative feedback networks for switch-mode power supplies.



LA Logic Analyzer

Can be used for parallel bus, protocol decoding and timing measurements.



Logic Analysis Probe

Provides two 8-channel splitters and simplifies connection to the device under test. When connecting with square pins, UT-M15 can be directly connected with 8X2 square pin headers with pins of 2.54mm. The UT-M15 offers excellent electrical characteristics with an input impedance of 101kΩ and a capacitive load of only 9.0pF.

Web Control

The oscilloscope can be accessed through the web page, saving the trouble of installing the upper computer software. Support PC and mobile phone dual platform control. Remote operation is more flexible and comfortable.

Technical Parameter

All specifications are warranted except those marked "Typical".

Unless otherwise stated, all specifications are for probes with the attenuation switch set to 10× and the MSO/UPO2000 series digital phosphor oscilloscope. To meet these specifications, an oscilloscope must first meet the following two conditions:

The instrument must run continuously for more than 30 minutes at the specified operating temperature.

If the operating temperature variation range reaches or exceeds 5 degrees Celsius, you must open the system function menu and execute the self-calibration function.

Model	UPO2102 UPO2104 MSO2102 MSO2104 MSO2102-S MSO2104-S	UPO2202 UPO2204 MSO2202 MSO2204 MSO2202-S MSO2204-S
Analog Bandwidth(-3dB)	100MHz	200MHz
Rise time (Typical value)	≤3.5ns	≤1.8ns*
Channels	UPO 2XX2:2 analog channel, UPO 2XX4:4 analog channel MSO2xx2:2 analog channel +16 digital channel, MSO2XX4:4 analog channel +16 digital channel	
	16 digital channels (UPO2000-16LA is optional for UPO series)	
	2-channel arbitrary wave generator output (MSO-S series AWG optional activation software function is required)	
Sampling methods	real-time sampling	
Acquisition Mode	Sampling, peak detection, envelope, high resolution, averaging	
Real time sampling rate	Analog channel：2GS/s(half channel interleaved)，1GS/s(all channel) Digital channel (MSO model only) : 1GS/s;	
Average	After all channels are sampled for N times at the same time, the N times can be selected from 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, and 8192	
Memory Depth	Analog channel: Automatic, 7kpts, 70kpts, 700kpts, 7Mpts, 28Mpts,56Mpts are optional	
	Digital channel (MSO model only) : Automatic, 7kpts, 70kpts, 700kpts, 7Mpts, 14Mpts,28Mpts,56Mpts are optional	
Waveform capture rate	200,000wfms/s	
	1,000,000wfms/s（Fast Acquire）	
Hardware real-time waveform recording and playback	120,000 frames	
display	8 inch 800x480 HD capacitive touch display	

* The typical rise time of 200MHz oscilloscope is 2.0ns for 1mV/div and 2mV/div.

Vertical system (analog channel)	
Coupling	DC, AC, GND
Impedance	（1MΩ± 2%）‖（16 pF± 3 pF）
Probe attenuation	0.001×，0.01×，0.1×，1×，10×，100×，1000×，Custom
Max. Input voltage （1MΩ）	400V Max（DC+Vpeak）
Vertical Resolution	8-bit
Vertical Scale	500uV/div ~20V/div（1 MΩ）
Offset Range	500uV/div～50mV/div：±2V（1MΩ） 100mV/div～500mV/div：±20V（1MΩ） 1V/div～5V/div：±200V（1MΩ） 10V/div～20V/div：±400V（1MΩ） With DC offset, shows vertical shift reading V
Bandwidth Limit	20 MHz
Low frequency response	(AC coupling, -3dB); ≤5 Hz (on BNC)
DC Gain Accuracy	<5mV：±3%，≥5mV：±2%
DC Offset Accuracy	≤±（2%+0.1div+2mV）
Unit	W, A, V, and U. The default value is V
Degree of channel isolation	Dc to maximum bandwidth: >40 dB
(Digital channel, MSO only)	
Threshold	Adjustable threshold for 8 channels 1 group
Threshold selection	TTL (1.4 V) 5.0 V CMOS (+2.5 V)，3.3 V CMOS (+1.65 V) 2.5 V CMOS (+1.25 V)，1.8 V CMOS (+0.9 V) ECL (-1.3 V) PECL (+3.7 V) LVDS (+1.2 V) 0 V Custom
Threshold value range	±20.0V, 20 mV step
Threshold accuracy	±(100 mV + 3% threshold setting)
Dynamic range	±10 V + threshold
Maximum input voltage	CAT I 40Vrms
Input impedance	（101 kΩ±1%）‖（9 pF ± 1 pF）
Minimum voltage swing	500 mVpp
Minimum detectable pulse width	2ns
Vertical resolution	1bit
Inter-channel delay	±100ns

Horizontal system (analog channel)	
Timebase Scale	1 ns/div to 1000 s/div (Display current sampling rate and storage depth)
Timebase Accuracy	≤±（50 + 2 × Use fixed number of year）ppm
Scope of delay	Pre-trigger (negative delay) : ≥1 screen width Post-trigger (positive delay) : 1 s to 10 s
Display Format	Y-T，default
	X-Y，CH1-CH2,CH1-CH3,CH1-CH4,CH2-CH3,CH2-CH4,CH3-CH4
	Roll，Time base ≥50 ms/div. Roll mode can be automatically entered or exited by adjusting the horizontal time base knob
Multi-Scopes	Number：2/4 Support each channel independent display, and independently adjustable time base
Trigger	
Trigger Level	Internal: ±5 div from the center of the screen EXT： ±1.8 V EXT/5： ±9 V
Trigger Mode	Auto, Normal, Single
Holdoff Range	80 ns -10 s
Coupling Frequency Response	DC: Passes all components of the signal
	AC: The direct current component that blocks the input signal
	HFRJ: Attenuates the high-frequency components above 40kHz
	LFRJ: Blocks the DC component and attenuates the low-frequency components below 40kHz
	Noise suppression: The high frequency noise in the signal is suppressed to reduce the probability of oscilloscope being triggered by mistake
Edge Trigger	
Slope	Rise、Fall、Any
Source	CH1～CH4/AC Line /EXT/D0～D15
Runt Trigger	
Pulse width conditions	＞、＜、≤≥，none
Polarity	Positive，Negative
Time Range	8 ns -10 s
Source	CH1～CH4
Window trigger	
Type	Rise、Fall、 Any
Trigger position	Enter，Exit，Time
Time	8 ns to 10 s
Source	CH1～CH4
Nth Edge trigger	
Slope	Rise、Fall
Free time	8 ns to 10 s
Edge number	1 to 65535
Source	CH1～CH4 or D0～D15

Delay trigger	
Slope	Rise、Fall
Delayed type	＞、＜、≤≥、＞＜
Delayed time	8 ns to 10 s
Source	CH1～CH4 or D0～D15
Time out trigger	
Slope	Rise、Fall、 Any
Time out	8 ns to 10 s
Source	CH1～CH4 or D0～D15
Duration trigger	
Type set	H、L、X
Trigger condition	＞、＜、≤≥
Duration	8 ns to 10 s
Source	CH1～CH4 or D0～D15
Setup Hold trigger	
Edge type	Rise、Fall
Data type	H、L
Setup time	4 ns to 10 s
Hold time	4 ns to 10 s
Source	CH1～CH4 or D0～D15
Pulse Trigger	
Pulse conditions	+wid（＞、＜、≤≥） -wid（＞、＜、≤≥）
Pulse width	1 ns to 4 s
Source	CH1～CH4、AC Line、EXT or D0～D15
Slope Trigger	
Conditions of the slope	Positive slope (greater than, less than, within the specified interval) Negative slope (greater than, less than, within a specified interval)
Time set	8 ns to 1 s
Source	CH1～CH4
Video Trigger	
Signal Standard	Support standard NTSC, PAL, and SECAM broadcast systems with lines ranging from 1 to 525(NTSC) and 1 to 625 (PAL/SECAM)
Source	CH1～CH4
Pattern Trigger	
Pattern Setting	H、L、X、Rising edge, falling edge
Source	CH1～CH4/D0～D15
RS232 / UART trigger	
trigger condition	Frame start, error frame, check error, data
Baud rate	2400bps、4800bps、9600bps、19200bps、38400bps、57600bps、115200bps、Custom
Data bits wide	5 bit、6 bit、7 bit、8 bit
Source	CH1～CH4 or D0～D15
I2C Trigger	

Condition	Start, Restart, Stop, loss confirmation, address, data, address data
Address bits wide	7 bit、10 bit
Address range	0 to 119、0 to 1023
bytes	1 to 5
Data qualifier	=、>、<
Source	CH1～CH4 or D0～D15
SPI Trigger	
Condition	Film selection, free time
timeout	100 ns to 1 s
Data bits	4 bit to 32 bit
The data set	H、L、X
The edge of the clock	Rise、Fall
Source	CH1～CH4 or D0～D15
CAN trigger	
Signal types	CAN_H、CAN_L
Condition	Frame beginning, DATA frame, REMOTE frame, ERROR frame, OVERLOAD frame, Identifier, Data, ID and Data, Frame end, loss acknowledgement, for padding error
Signal rate	10kbps、20kbps、31.25 kbps 、33.3kbps、37kbps、、50kbps、62.5kbps、68.266kbps、83.3kbps、92.238kbps、100kbps、125kbps、153kbps、250kbps、400kbps、500kbps、800kbps、1Mbps、Custom
Source	CH1～CH4 or D0～D15
CAN - FD trigger	
Signal types	CAN_H、CAN_L
Condition	Frame beginning, DATA frame, REMOTE frame, ERROR frame, OVERLOAD frame, Identifier, Data, ID and Data, Frame end, loss acknowledgement, for padding error
Baud Rate	10kbps、20kbps、31.25 kbps 、33.3kbps、37kbps、、50kbps、62.5kbps、68.266kbps、83.3kbps、92.238kbps、100kbps、125kbps、153kbps、250kbps、400kbps、500kbps、800kbps、1Mbps、Custom
FD bit rate	250kbps、500kbps、800kbps、1Mbps、1.5Mbps、2Mbps、4Mbps、6Mbps、8Mbps、 Custom
Source	CH1～CH4 or D0～D15
LIN trigger	
Condition	Synchronization, identifiers, Data, ID and data, wake frame, sleep frame, Error
speed signal	V1、V2、Both
Baud Rate	2.4kbps、4.8kbps、9.6kbps、19.2kbps、Custom
Data Length	1～8
Source	CH1～CH4 or D0～D15
FlexRay trigger	
trigger condition	Frame beginning, indicator, identifier, loop number, Header field, Data, ID and data, frame end, Error
polarity	BM、BDiff or BP

Bit rate	2.5Mbps、5Mbps、10Mbps
Source	CH1～CH4 or D0～D15
Decode	
Decoding the number	One serial, two parallel
Decoding type	RS232/UART、I²C、SPI、CAN、CAN-FD、LIN、FlexRay
parallel	Up to 18-bit parallel bus decoding, support analog channel and digital channel combination. Supports custom clock Settings.
Source	CH1～CH4 or D0～D15
Measure	
cursor	Voltage difference between cursors (△V) Time difference between cursors (△T) Inverse of △T (Hz)(1/△T)
	The voltage value and time value of the waveform point
	Allows the cursor to be displayed during automatic measurements
Automatic measurement	Analog channel: Max,Min ,High, Low, Ampl, Pk- Pk, Middle, Mean,Cycmean,RMS,CycRMS,AC RMS, Period,Freq,Rise,Fall,RiseDelay,FallDelay,+Width,-Width, FRFR, FRFF,FFFR, FFFF, FRLF, FRLR, FFLR, FFLF, +Duty,-Duty,Area,CycArea,Oversht,Presht,Phase,Pulse, a total of 36 measurement parameters; Digital channel: Freq, period, +Width,-Width, +Duty,-Duty, RiseDelay A→B, FallDelay A→B, phase A→B, phase B→A
Number of measurements	5 measurements are displayed simultaneously
Measuring range	Screen or cursor
XY measurement	Support time, Cartesian coordinates, polar coordinates, product and proportion display
Measurement statistics	Mean, maximum, minimum, standard deviation and number of measurements
Frequency meter	7-bit hardware frequency meter
Mathematical operations	
Waveform calculation	A+B、A-B、A×B、A/B、FFT、Can edit advanced operation, logic operation
FFT window type	Rectangle、Hanning、Blackman、Hamming
FFT display	Split screen,Full screen;The time base is independently adjustable
FFT vertical scale	Vrms、dBVrms
FFT	Display mode: full screen, split screen and waterfall
	Spectrum range Settings: start frequency, end frequency, center frequency, sweep width
	Detection mode: Normal, average, maximum hold, minimum hold
	Tags: Tag type, tag trace, tag maximum number of points, event list
Digital filtering	Low pass, high pass, band pass, band stop
Logical operations	and, or, not, xor
Advanced computing	0,1,2,3,4,5,6,7,8,9, (, +, -, *, /, ^, >, <, &&, ‖, ==, !=,)

Mathematical function	Sin, Cos, Sinc, Tan, Sqrt, Exp, Lg, In, Floor, ABS, Acos, Asin, Atan, Sinh, Tanh, Ceil, Cosh, Fabs
Storage	
Setting	Internal (256 groups), external USB memory
Waveform	Internal (256 groups), external USB memory
Bitmap	External USB memory, and can store related parameter information.
Signal source (MSOXXXX-S model only)	
Channel	2
Sampling Rate	250MS/s
Vertical Resolution	16 bits
Max. Output Frequency	50 MHz
Waveforms	Sine wave, square wave, ramp wave, pulse wave, noise, DC, arbitrary wave
Built-in waveform	Sinc, exponential rise, exponential fall, electrocardiogram, Gauss, Lorentz, semi-orthogonality
Sine	Frequency：1 μHz to 50 MHz
	Amplitude Flatness：±0.5 dB（Relative to 1 kHz）
	Harmonic Distortion(typical)：-40 dBc
	Spurious (non-harmonic)(typical)：-40 dBc
	Total Harmonic Distortion (typical)：1% (DC～20kHz，1Vpp)
	Spurious (non-harmonic)：40 dB
Square/pulse	Frequency range：Square wave: 1μHz to 15 MHz; Pulse: 1μHz to 15 MHz
	Rise and fall time：<13 ns （Typical values 1kHz，1Vpp，50Ω)
	overshoot：Typical values 2% (1kHz，1Vpp，50Ω)
	Duty ratio：Square wave: 1% to 99%, adjustable; Pulse: 1% to 99%, adjustable
	Duty cycle resolution：1% or 10 ns (whichever is larger)
	The minimum pulse width：20 ns
	Pulse width resolution：10 ns
	jitter：2ns
ramp wave	Frequency range：1 μHz to 400 kHz
	linearity：1%
	symmetry：0.1%-99.9%
noise	bandwidth：50 MHz（Typical values）
Built-in wave	Frequency range：1μHz to 5MHz
Arbitrary wave	Frequency range：1μHz to 5MHz
	wave length：8 to 512K points (Play mode)
	Internal storage location：10
Frequency	Accuracy: 100 ppm (less than 10 kHz);50 ppm (greater than 10 kHz)
	Resolution ： 1μHz
Amplitude	Output range: 20 mVpp to 6 Vpp (high resistance);10 mVpp to 3 Vpp (50 Ω)
	Resolution: 1mV
	Accuracy: ±5%
DC offset	Accuracy：2%（1 kHz）
	Range: ± 3V (high resistance); ±1.5 V (50 Ω)
	Resolution: 1mV

	Accuracy: Offset setting value ±5%
AM modulation	
Carrier	Sine, square wave, oblique wave, arbitrary wave
Source	internal
Modulation wave	Sine, square wave, ascending oblique wave, ascending oblique wave, noise, arbitrary wave
Modulation frequency	2mHz～50kHz
Modulation depth	0%～120%
FM modulation	
carrier	Sine, square wave, oblique wave, arbitrary wave
Source	internal
modulation wave	Sine, square wave, ascending oblique wave, ascending oblique wave, noise, arbitrary wave
Modulation frequency	2mHz～50kHz
deviation	12.5MHz(max)
Display	
Display type	8-inch TFT LCD
Resolution of display	800 horizontal ×RGB×480 vertical pixels
display color	24 - bit true colors
persistence	Minimum value, 50ms, 100ms, 200ms, 500ms, 1s, 5s, 10s, 20s, infinite
Menu Hold	Hold time: 5S, 10s, 20S, infinite
Display type	Point, vector
Real time clock	Time and date (user adjustable)
Bode	
Start frequency	50 Hz～50 MHz
Stop frequency	60 Hz～50 MHz
Points	1～1000
Output amplitude	High resistance：20 mVpp to 6 Vpp 50Ω：10 mVpp to 3 Vpp
interface	
Standard or optional	USB-host, USB-Device, LAN, EXT Trig, AUX Out(Trig Out\Pass/Fail) output, signal source output interface (only MSO-S model), VGA
General technical specifications	
Probe compensator output	
output voltage	About 3Vp-p
frequency	10Hz,100Hz,1kHz(default),10kHz
Power supply	
power supply voltage	100V~240VACrms (Fluctuations±10%), 50Hz/60Hz
power	100VA
Fuse	2.5A, F class, 250V
Environment	
Temperature range	Operation：0℃～+40℃

	Not operation：-20℃～+70℃		
Cooling method	Forced fan cooling		
Humidity range	Operation: +35℃ ≤90% relative humidity; No operation: +35 ° C to +40 ° C ≤ 60% relative humidity		
altitude	Operation: below 3000 meters; Non-operational: up to 15,000 m		
Pollution degree	2		
Operating environment	Indoor use		
Mechanical specifications			
size(W×H×D)	370mm×185mm×115mm		
weight	4.5 kg		
Adjust the interval			
The calibration interval is recommended	1 year		
Standard			
Electromagnetic compatibility	Comply with EMC Directive (2014/30/EU), comply with or better than IEC 61326-1:2021/EN61326-1:2021，IEC 61326-2-1:2021/EN61326-2-1:2021		
	Conduction disturbance	CISPR 11/EN 55011	CLASS B group 1，150kHz-30MHz
	Radiated disturbance	CISPR 11/EN 55011	CLASS B group 1，30MHz-1GHz
	Electrostatic discharge (ESD)	IEC 61000-4-2/EN 61000-4-2	4.0 kV（contact），8.0 kV（air）
	Radio-frequency electromagnetic field Immunity	IEC 61000-4-3/EN 61000-4-3	0V/m（80 MHz to 1 GHz）; 3V/m（1.4 GHz to 2 GHz）; 1V/m（2.0 GHz to 2.7GHz）
	Electrical fast transients (EFT)	IEC 61000-4-4/EN 61000-4-4	2kV (Input AC Power Ports)
	Surges	IEC 61000-4-5/EN 61000-4-5	1kV(Line to line) 2kV(Line to ground)
	Radio-frequency continuous conducted Immunity	IEC 61000-4-6/EN 61000-4-6	3V,0.15-80MHz
	Voltage dips and interruptions	IEC 61000-4-11/EN 61000-4-11	Voltage Dips: 0% UT during 1 cycle; 40% UT during 10/12 cycles;

			70% UT during 25/30 cycles Short interruption：0% UT during 250/300 cycles
Safety	EN 61010-1:2010+A1:2019 EN IEC61010-2-030:2021+A11:2021 BS EN61010-1:2010+A1:2019 BS EN IEC61010-2-030:2021+A11:2021 UL 61010-1:2012 Ed.3+ R:19 Jul2019 UL 61010-2-030:2018 Ed.2 CSA C22.2#61010-1:2012 Ed.3+U1; U2; A1 CSA C22.2#61010-2-030:2018 Ed.2		

*The MSO/UPO2000 series have been certified by CE, UKCA, cETLus.

Order information

	Description	Standard Quantity per Carton	Order No.
Model	MSO2204-S (200MHz,2GSa/s,4CH+16 digital, AWG)	1	MSO2204-S
	MSO2104-S (100MHz,2GSa/s,4CH+16 digital, AWG)	1	MSO2104-S
	MSO2202-S (200MHz,2GSa/s,2CH+16 digital, AWG)	1	MSO2202-S
	MSO2102-S (200MHz,2GSa/s,2CH+16 digital, AWG)	1	MSO2102-S
	MSO2204 (200MHz,2GSa/s,4CH+16 digital)	1	MSO2204
	MSO2104 (100MHz,2GSa/s,4CH+16 digital)	1	MSO2104
	MSO2202 (200MHz,2GSa/s,2CH+16 digital)	1	MSO2202
	MSO2102 (100MHz,2GSa/s,2CH+16 digital)	1	MSO2102
	UPO2204 (200MHz,2GSa/s,4CH)	1	UPO2204
	UPO2104 (100MHz,2GSa/s,4CH)	1	UPO2104
	UPO2202 (200MHz,2GSa/s,2CH)	1	UPO2202
	UPO2102 (100MHz,2GSa/s,2CH)	1	UPO2102
Standard accessories	Power cord that conforms to the standard of the destination country	1	--
	USB data cable	1	--

	BNC-BNC straight-through cable (only MSO-S)	1	UT-L45
	BNC-red and black alligator clip cable (only MSO-S)	1	UT-L02A
	Passive probe (200MHz/100MHz)	2/4	UT-P05/UT-P04
	Logic analyzer probe (only MSO)	1	UT-M15
Optional accessories	Serial bus trigger and decode options (MSO/UPO2000-EMBD& MSO/UPO2000-AUTO)	--	MSO/UPO2000-BND
	Serial bus trigger and decode options (includes RS232, UART, I2C, SPI)	--	MSO/UPO2000-EMBD
	RS232/UART trigger and decode options	--	MSO/UPO2000 -COM
	I2C trigger and decode options	--	MSO/UPO2000 -I2C
	SPI trigger and decode options	--	MSO/UPO2000 -SPI
	Automotive serial bus triggering and decoding options (CAN, CAN-FD, LIN, FlexRay)	--	MSO/UPO2000-AUTO
	CAN trigger/decode option	--	MSO/UPO2000-CAN
	CAN-FD trigger/decode option	--	MSO/UPO2000-CAN-FD
	LIN trigger/decode option	--	MSO/UPO2000-LIN
	FlexRay trigger/decode option	--	MSO/UPO2000-FlexRay
	Bode plot loop test analysis (software)	--	MSO-BODE
	Isolation transformer		UT-ISOT
	16 digital channels option (software)	--	UPO2000-16LA
	High voltage probe	--	UT-V23，UT-P21
	High-Voltage Differential Probes	--	UT-P30，UT-P31，UT-P32，UT-P33，UT-P35，UT-P36
	Current Probe	--	UT-P40，UT-P41，UT-P42，UT-P43，UT-P44
	16-way logic analyzer probe	--	UT-M15

Note: All mainframes, accessories and options can be ordered from your local UNI-T dealer.

UNI-T oscilloscope probes and accessories supported by MSO/UPO2000 series

Passive probe

Model	Type	Description
UT-P01 	High impedance probe	1X:DC ~ 8MHz 10X:DC ~ 25MHz Oscilloscope compatibility: UNI-T all series
UT-P03 	High impedance probe	1X:DC ~ 8MHz 10X:DC ~ 60MHz Oscilloscope compatibility: UNI-T all series
UT-P04 	High impedance probe	1X:DC ~ 8MHz 10X:DC ~ 100MHz Oscilloscope compatibility: UNI-T all series
UT-P05 	High impedance probe	1X:DC ~ 8MHz 10X:DC ~ 200MHz Oscilloscope compatibility: UNI-T all series
UT-P06 	High impedance probe	1X:DC ~ 8MHz 10X:DC ~ 300MHz Oscilloscope compatibility: UNI-T all series
UT-P07 	High impedance probe	1X:DC ~ 8MHz 10X:DC ~ 500MHz Oscilloscope compatibility: UNI-T all series
UT-P08	High	1X:DC ~ 8MHz

	impedance probe	10X:DC ~ 350MHz Oscilloscope compatibility: UNI-T all series
UT-P20 	High impedance probe	DC ~ 100MHz Probe coefficient 100:1 Maximum operating voltage 1500Vrms Oscilloscope compatibility: UNI-T all series
UT-V23 	High voltage probe	DC ~ 100MHz Probe coefficient 100:1 Input resistance 100MΩ±2% Maximum operating voltage 2000Vpp Oscilloscope compatibility: UNI-T all series
UT-P21 	High voltage probe	DC ~ 50MHz Probe coefficient 1000:1 Maximum operating voltage DC 15kVrms，AC 10kV(sine wave) Oscilloscope compatibility: UNI-T all series
UT-P40 	Current probe	DC ~ 100kHz Range 50mV/A, 5mV/A Current range 0.4A ~ 60A Maximum operating voltage 600Vrms Oscilloscope compatibility: UNI-T all series
UT-P41 	Current probe	DC ~ 100kHz Range 100mV/A, 10mV/A Current range 0.4A ~ 100A Maximum operating voltage 600Vrms Oscilloscope compatibility: UNI-T all series
UT-P42	Current probe	DC ~ 150kHz

		Range 100mV/A, 10mV/A Current range 0.4A ~ 200A Maximum operating voltage 600Vrms Oscilloscope compatibility: UNI-T all series
UT-P43 	Current probe	DC ~ 25MHz Range 100mV/A Maximum measurement current 20A Rise time 14ns Oscilloscope compatibility: UNI-T all series
UT-P44 	Current probe	DC ~ 50MHz Range 50mV/A Maximum measurement current 40A Rise time 7ns Oscilloscope compatibility: UNI-T all series

Active probe

Model	Type	Description
UT-P30 	High-Voltage Differential Probes	DC ~ 100MHz Attenuation ratio 100:1,10:1 Input differential voltage ±800Vpp Oscilloscope compatibility: UNI-T all series
UT-P31 	High-Voltage Differential Probes	DC ~ 100MHz Attenuation ratio 1000:1,100:1 Input differential voltage ±1.5kVpp Oscilloscope compatibility: UNI-T all series
UT-P32 	High-Voltage Differential Probes	DC ~ 50MHz Attenuation ratio 1000:1,100:1 Input differential voltage ±3kVpp Oscilloscope compatibility: UNI-T all series
UT-P33	High-Voltage	DC ~ 120MHz

	Differential Probes	Attenuation ratio 100:1,10:1 Input differential voltage ±14kVpp Oscilloscope compatibility: UNI-T all series
UT-P35 	High-Voltage Differential Probes	DC ~ 50MHz Attenuation ratio 500:1,50:1 Rise time 7ns Accuracy 2% Input differential mode voltage 1/50:130(DC+peakAC) 1/500:1300(DC+peakAC) Input common mode voltage 100Vrms, CATI 600Vrms, CATII Oscilloscope compatibility: UNI-T all series
UT-P36 	High-Voltage Differential Probes	DC ~ 50MHz Attenuation ratio 2000:1,200:1 Rise time 3.5ns Accuracy 2% Input differential mode voltage 1/200:560(DC+peakAC) 1/2000:5600(DC+peakAC) Input common mode voltage 2800Vrms, CATI 1400Vrms, CATII Oscilloscope compatibility: UNI-T all series

Accessory	Standard
National power cable	1
USB line	1
Passive probe	1 set (2, apply to 2 channel model)

Warranty

Three-years warranty, excluding probes and accessories. Please visit https://instruments.uni-trend.com/list_190/65.html to learn more information. To protect your investment, please purchase from UNI-T official authorized global distriburots.

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