# Datasheet

## MSO2000X Series Mixed Signal Oscilloscope

V1.1

August 2024

# Product Introduction

MSO2000X series mixed signal oscilloscope with the maximum bandwidth of 300 MHz, maximum sampling rate of 5 GSa/s and equipped with 4 analog channels and 16 digital channels, the memory depth up to 100 Mpts/CH. MSO2000X has unique Ultra Phosphor 3.0 technology, the waveform capture rate is up to 2,000,000 wfms/s, 256 grey temperature color, innovative digital trigger system with high trigger sensitivity and low jitter. This oscilloscope supports multiple advanced triggers, serial bus trigger and decoding, and supports the advanced sampling and analysis mode of spectrum analyzing, power analysis, histogram, waveform recording, enhanced resolution (ERES), hardware acceleration template testing, Search and Navigate. In addition, this oscilloscope has multiple measurements and mathematical operations. The MSO2000X series features a 10.1-inch capacitive touch screen that supports multiple gestures for common waveform operations. With the addition of one-touch keys on the front panel, this design significantly enhances oscilloscope operation efficiency and elevates the overall user experience.

# Mainstream touchscreen design, intelligent interactive experience

The 10.1-inch HD capacitive multi-touch screen supports a variety of gesture operations, including touch, drag, zoom, and rectangle drawing, making the interface more intuitive and user-friendly. While retaining traditional key and knob controls, the instrument also supports mouse and keyboard input, offering versatile operation options and significantly enhancing the interactive experience.
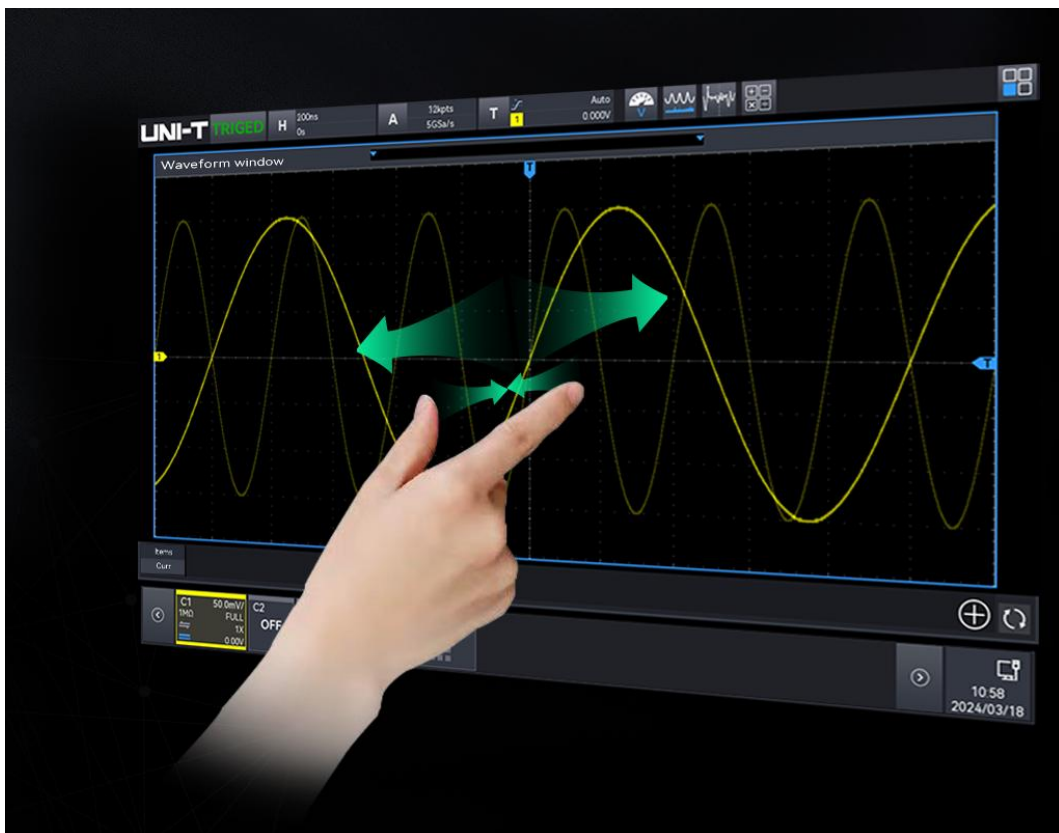
# Brand new appearance design

Innovative instrument appearance, double thinning design; The display is horizontal with the panel, improving the touch operation texture and visual range; Screen edge black frame decoration + white body, the whole machine introduction atmosphere.
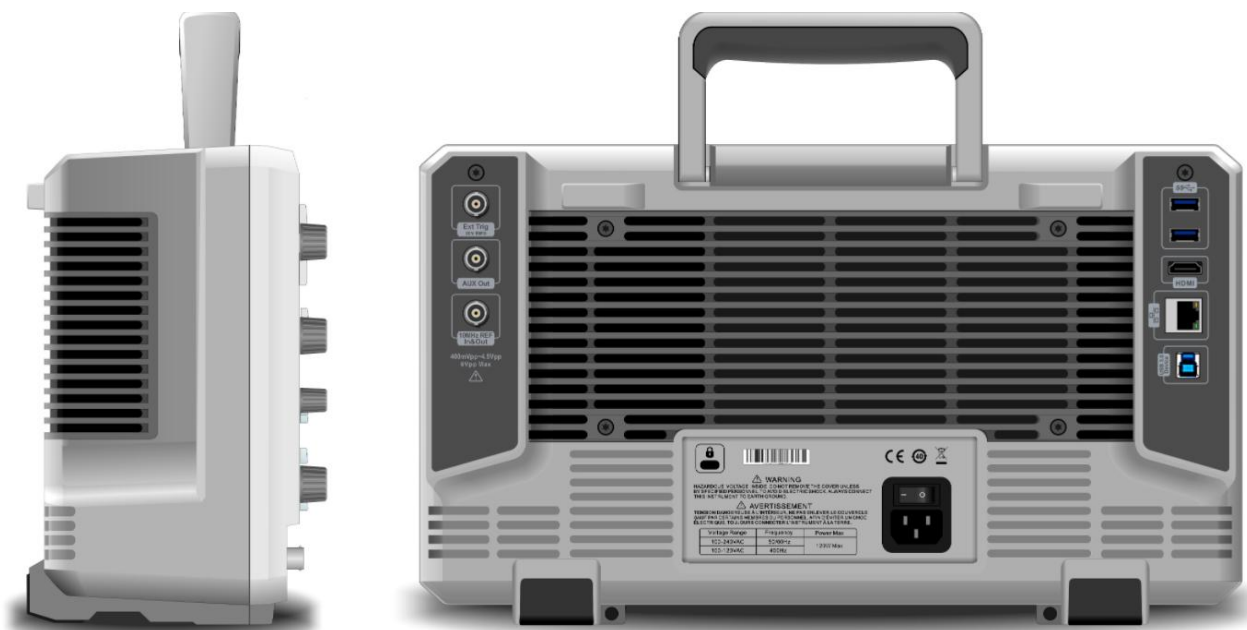
# Features and advantage

- Analog channel bandwidth: 300 MHz/200 MHz/100 MHz

- Real-time sampling rate of the analog channel is up to 5 GSa/s. The maximum sampling rate of the digital channel is 1.25 GSa/s

- 4 analog channels, 16 digital channels. Maximum memory depth: 100 Mpts

- The maximum waveform capture rate is 500,000 wfms/s (**sequence mode: 2,000,000 wfms/s**)

- 9 instrument functions: Digital Oscilloscope, Logic Analyzer (requires UT-M15), Function/Arbitrary Waveform Generator (option), Spectrum Analyzer, Digital Voltmeter, Frequency Counter, Protocol Analyzer, Bode Plot Analyzer and Power Analyzer (option)

- Built-in dual-channel 50MHz function/arbitrary waveform generator. Supports loading on-screen oscilloscope data for real-time arbitrary waveform output. Additionally, it includes multiple built-in arbitrary waveforms, enhancing its versatility and functionality.

- Bode plot loop test analysis to analyze the system stability

- Parameter measurement adds histogram and line graph display

- Up to 125,000 frames of uninterrupted hardware real-time waveform recording and analysis, with USB memory export support waveform recording and analyze

- Maximum 4 Mpts enhanced FFT, supporting the spectrum analyzer function of frequency setting, waterfall curve, detection setting and marker

- 54 kinds of parameter measurement

- Multi-channel 7-digit hardware frequency counter, supporting adjustable frequency refresh time and effective digit

- 4-digit Digital Voltmeter (DVM): DC, AC RMS and DC+AC RMS

- Multiple trigger types: edge, pulse width, ramp, runt pulse, over-amplitude pulse, delay, timeout, duration, setup & hold, Nth edge and code pattern

- Protocol trigger and decoding functions. Included: RS232/UART, I2C, SPI. Optional: CAN, CAN-FD, LIN, FlexRay, AUDIO, SENT

- Zone triggering for capturing accidental signal and observing complicated signal

- Ultra Phosphor 3.0 super phosphor display effect, up to 256 grey display

- 10.1-inch **1280x800 HD capacitive multi-touch screen**, supporting gesture control: click, slide, zoom, edit and drag

- Multiple peripheral interfaces: USB 3.0 Host, USB 3.0 Device, LAN, EXT Trig, AUX Out (Trig Out, Pass/Fail, DVM), Gen Out, HDMI

- SCPI (Standard Command for Programmable Instrument)

- Built-in Webserver for accessing and controlling the instrument through browser, supporting PC/Mobile phone device for cross-platform access to the instrument

# Design Features

# Cost-effective Nine-in-One integrated oscilloscope

MSO2000X series integrates 9 instrument functions, which includes Digital Oscilloscope, Logic Analyzer, Function/Arbitrary Waveform Generator, Spectrum Analyzer, Digital Voltmeter, High-Precision Frequency Counter, Protocol Analyzer, Bode plot Analyzer and Power Analyzer. This oscilloscope offers a cost-effective solution for users.
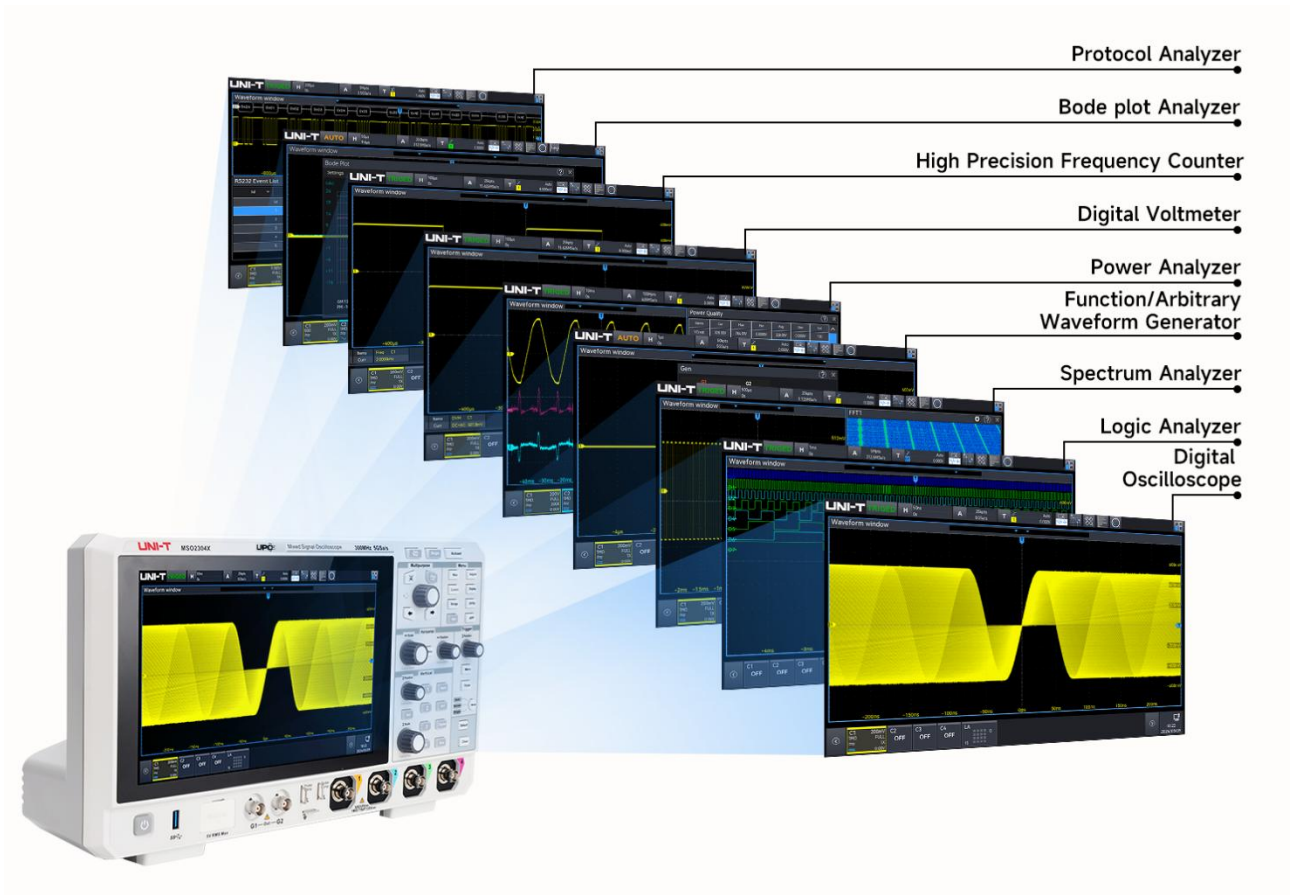
## Digital Oscilloscope

- Bandwidth: 100 MHz/200 MHz/300 MHz

- Maximum real-time sampling rate: 5GSa/s

- Maximum memory depth: 100 Mpts

- 4 analog channels, 1 external trigger channel
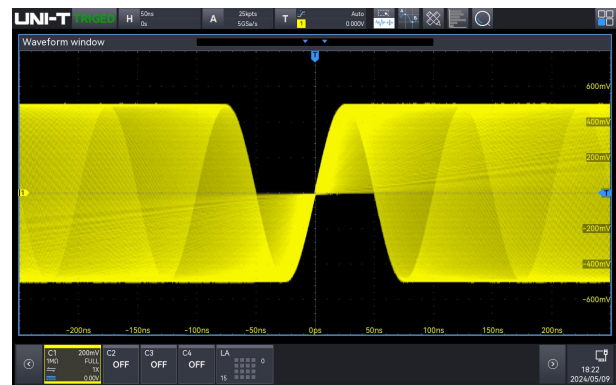


## Logic Analyzer (Option)

- 16-channel logic analyzer can be used with purchase of a UT-M15 logic analyzer probe (option)

- Logic analyzer software already installed

- Maximum sampling rate: 1.25 GSa/s

- Maximum memory depth: 100 Mpts

- Minimum detectable pulse width 800ps

- Digital probe provides high 8-bit and low 8-bit signal input port, it simplifies the connection of DUT. When connecting to a square pins, UT-M15 can be connected directly to 8x2 square pins 2.54 mm



- Logic analyzer probe UT-M15 has great electrical feature, the input impedance is 101 Ω±1%, but the capacitive load is only 9.0 pF

## Function/Arbitrary Waveform Generator (Option)

- 50 MHz equivalent performance dual channel Output

- Sampling rate: 250 MSa/s

- Vertical resolution: 16-bit

- Built-in multiple standard waves: Sine, square, pulse, ramp, arbitrary, noise and DC

- AM, FM, ASK, FSK and sweep output

## Spectrum Analyzer

- Standard enhanced FFT, up to 4 Mpts, 4 channels signal analysis
- Frequency range: 0 Hz to 1.25 GHz
- Waterfall curve
- 4 traces and 4 detections
- Mark type: Auto, manual and threshold
- Marker point list
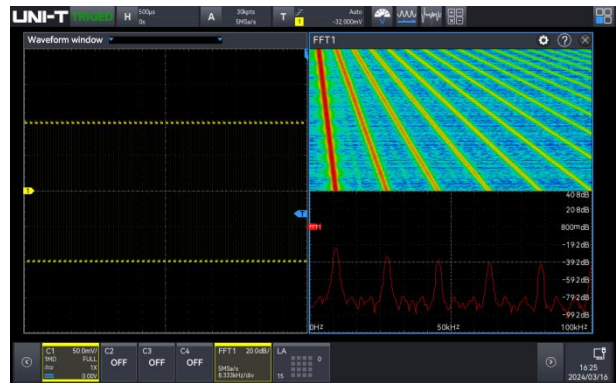
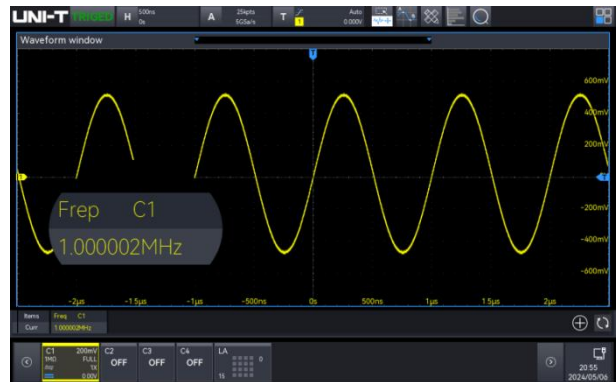## Digital Voltmeter

- 4-digit voltmeter
- DC/ACRMS/AC+DCRMS
- Limit alarm

## High-Precision Frequency Counter

- 7-digit hardware frequency counter
- Adjustable frequency counter refresh time and effective digit
- Totalizer

## Bode Plot Analyzer

- Included with Function/Arbitrary Waveform Generator option
- Frequency response analysis
- Loop stability analysis
- Filter analysis
- Amplifier analysis

## Protocol Analyzer

- 9 kinds of trigger protocol and decoding, including computer serial bus, embedded serial bus, automobile, aerospace and audio

- Decoding can be operated in the pause and record modes

- Event list and search function



| Option name | Description | Option model | Standard/Option |
|---|---|---|---|
| Computer serial bus triggering and decoding | RS-232/422/485/UART | - | Standard |
| Embedded serial bus triggering and decoding | I2C, SPI | - | Standard |
| Automobile serial bus triggering and decoding | CAN | MSO2000X-CAN | Option |
| Automobile serial bus triggering and decoding | LIN | MSO2000X-LIN | Option |
| Automobile serial bus triggering and decoding | CAN-FD | MSO2000X-CAN-FD | Option |
| Automobile serial bus triggering and decoding | FlexRay | MSO2000X-FLEX | Option |
| Automobile sensor bus triggering and decoding | SENT | MSO2000X-SENT | Option |
| Audio serial bus triggering and decoding | Audio | MSO2000X-AUDIO | Option |

## Power Analyzer (Option)

With the development of chip technology, the power supply system requirements are also increased. When the power supply network of small voltage and high current has been the trend, especially for the chip or the power supply network composed of precision components, the requirements of the various parts of the circuit reliable power supply and noise suppression, but also to ensure that the integrity of the signal transfer between the chip, the power supply test has ushered in a greater challenge. The designer is more concerned about the energy-saving power supply and the response speed to ensure that the power supply is stable and clean.

Based on the currently tendency, the power integrity testing is particularly important, it directly affects the signal integrity, and in turn the signal quality also reflects the power quality, and even power quality will cause a series of electromagnetic interference problems, which makes the designer more headaches. So having an oscilloscope that can analyze the power supply is undoubtedly your most correct choice.

MSO2000X provides a full range of power analysis tools and evaluation results, you only need to select the appropriate analysis type, connecting the voltage probe and the current probe to the test point of power system or specified test fixtures as shown in the diagram, connecting to the channel that you want to observe, and then finally make appropriate fine-tuning to get the results you want.

- Power quality
- Harmonic analysis
- Safety operation area*

- Ripple wave analysis
- Loop analysis



* Power analysis support is subject to the latest firmware on the official website.

# Ultra Phosphor 3.0

When you try to find and debug the occasional or intermittent anomalies in the signal, the waveform capture rate is a very important indicator. The capture rate of an oscilloscope is the ability to capture how many waveforms per unit of time, it reflects the oscilloscope speed of the process and analysis signal.

MSO2000X adopts advanced software and hardware architecture to achieve data processing that is 5 to 10 times higher than the previous version. It is equipped with Ultra Phosphor 3.0, which supports 8-channel parallel graph mapping, the processing rate is up to 20 Gbps, the waveform capture rate is up to 500,000 wfms/s, and up to 2,000,000 wfms/s in the sequence mode. Compared with the traditional oscilloscope, the dead time of MSO2000X can be < 1μs, that is, capture 1.17 ns fast edge signal of 2000,000 per second, so the accidental signal can be captured easily and correctly.
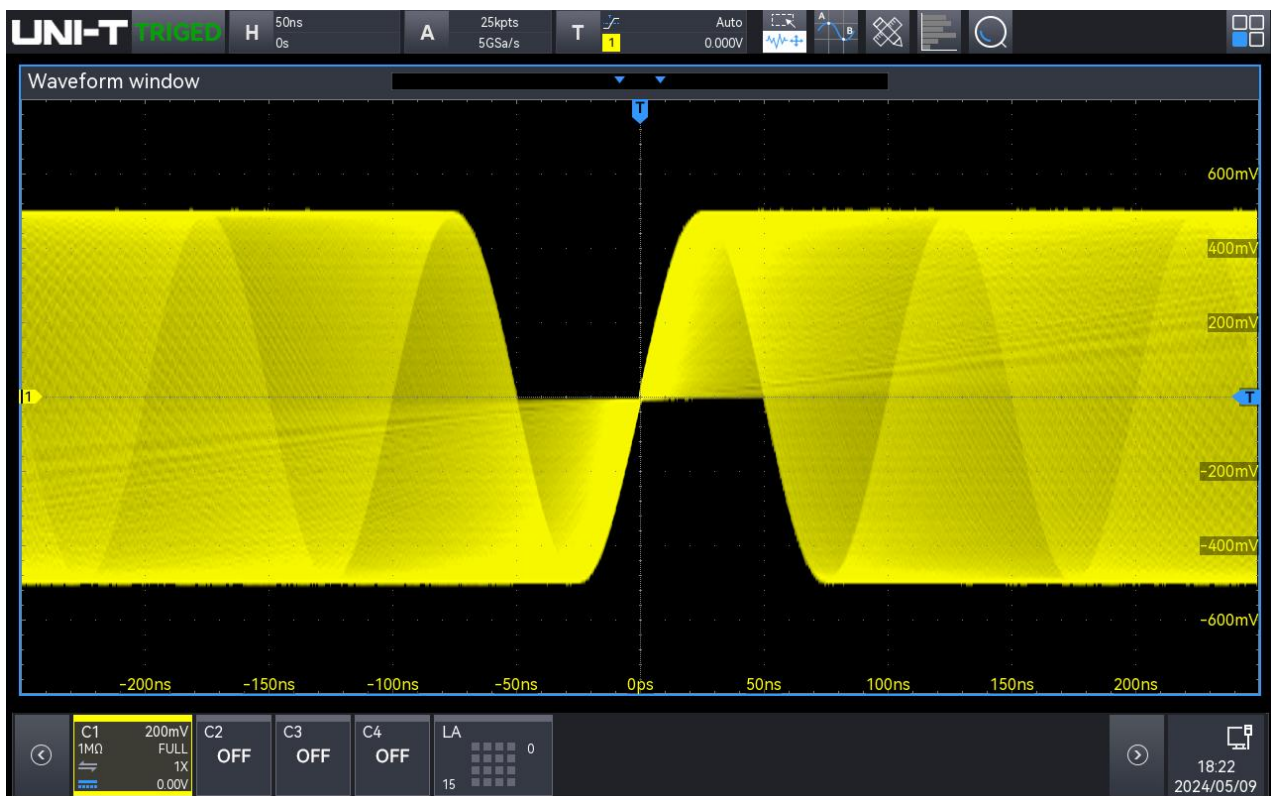
# Multi-Windows

Multi-Windows can be freely dragged and extended.



# Brand new quick Autoset strategy

Fuzzy control is an intelligent control method based on fuzzy set theory, fuzzy linguistic variables and fuzzy logic reasoning. The advantages of the algorithm are fewer iterations, faster speed, and better anti-interference ability.

In the past, the oscilloscope performed Autoset to find the appropriate signal amplitude and frequency to display, but the response speed of oscilloscopes is very different due to different solutions adopted by each oscilloscope manufacturer. This affected the experience of using oscilloscopes.

UNI-T redefines the execution of Autoset by adopting fast fuzzy algorithm based on analog signals and multi-channel parallel processing technology, combined with a 7 bits high-precision hardware frequency counter, which allows the oscilloscope to quickly find and process the amplitude and frequency of the unknown signals displayed when executing the Autoset strategy. It takes less than 1.5s to open the whole channel, and less than 1s to open a single channel, which greatly improves the working efficiency and reduces the risk of errors for users who need to change test objects frequently and need to test quickly.

# Multiple parameter measurements

The parameter measurement is a very important function for engineer when using an oscilloscope. MSO2000X series provides 54 kinds of measurement parameters and added 27 measurement parameter can be displayed at the same time. Each page of measurement statistics displays 9 measurement parameters, and it can be displayed in histogram and tendency chart. The histogram can visually show the possibility distribution of the parameter. The tendency chart can reflect the parameter changing with time.

The parameter snapshot displays 39 kinds of test items for a single channel measurement. The parameter of parameter snapshot includes the measurement parameter of voltage and time in single channel, the measured result will be constantly refreshed during the process. MSO2000X series adds a new strategy of amplitude calculation, top and bottom. These enhancements simplify the use of the parameter measurement function for engineers. In addition, the added burst function of MSO2000X series can display the burst parameter, so that the channel measured data can be learned accurately and immediately.

# Waveform math

MSO2000X provides a system of algorithms for complex waveform math that you can use to further process your waveforms and display the results directly on the oscilloscope.

- Basic operation: +, -, *, ÷
- Digital filter (high-pass, low-pass, band-pass and band-limit)
- Custom function operation: analog channel, reference waveform
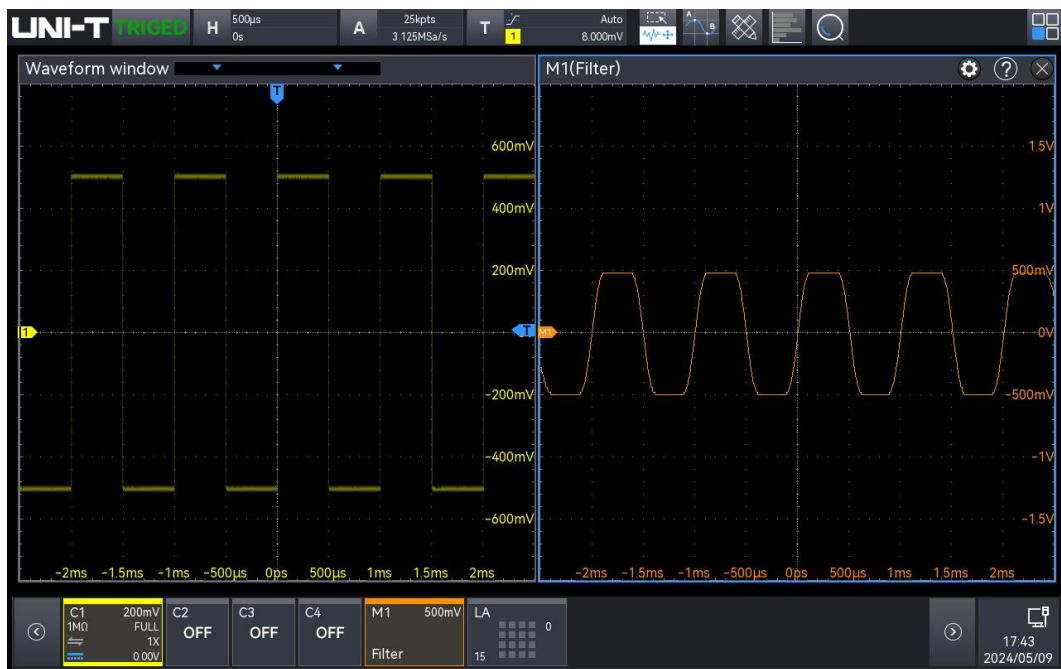
# Navigate and Search

The memory depth of MSO2000X series is upgraded to 100 Mpts, and the high memory depth can capture tens of thousands of waveforms in one capture. It takes a lot of time for engineers to search the waveform by themselves. Uni-T offers search conditions that can be customized, which is very useful for searching the sampled signal and finding the waveform of interest. With the analysis function, the event can be analyzed in detail, eliminating the time consuming and inconvenience of manual search.
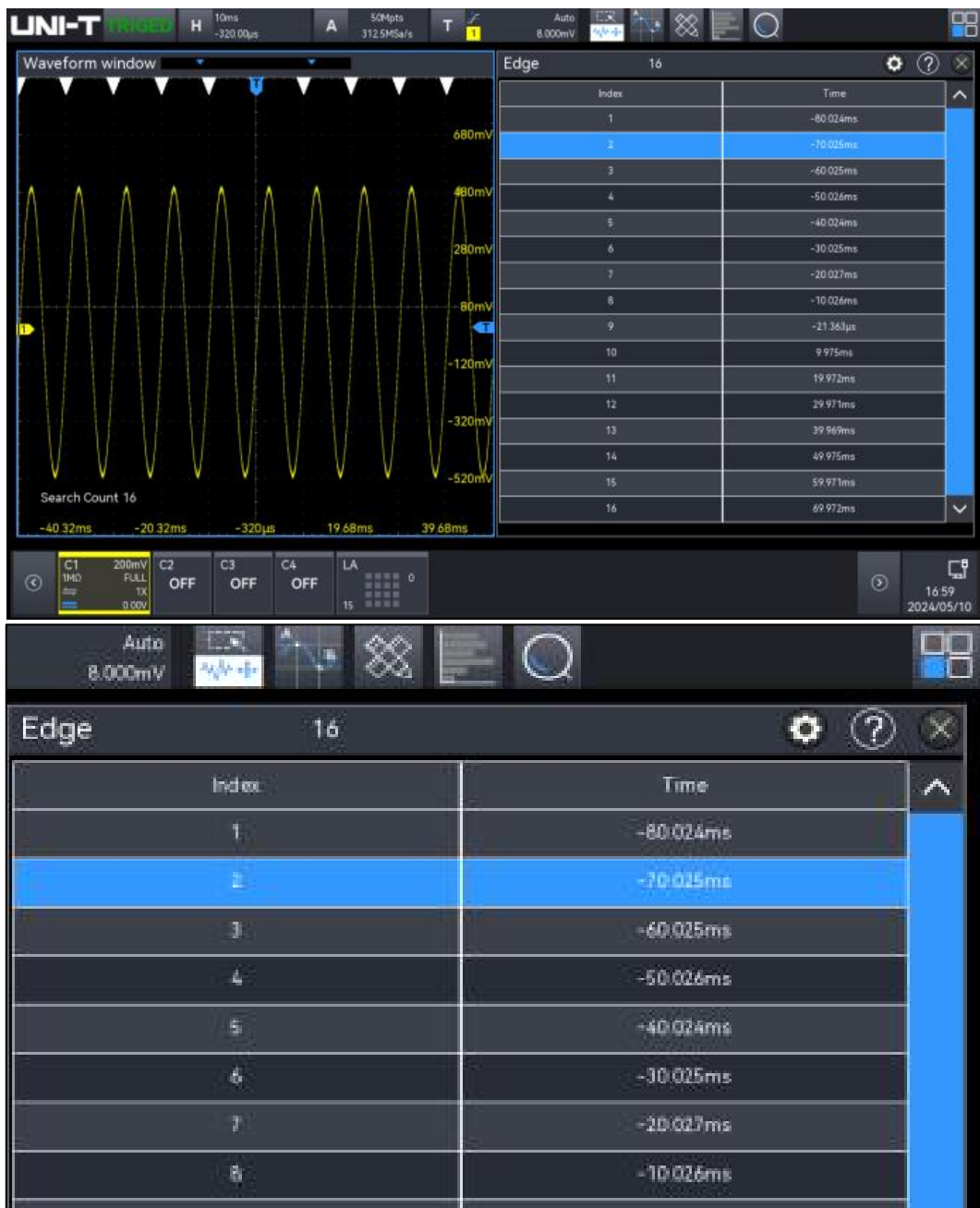
# Zone triggering

The zone triggering function offers two key advantages: isolating occasional abnormal signals and stabilizing the waveform display. A stable trigger is essential for a consistent waveform display, and this feature ensures engineers can effectively manage complex and variable signals during debugging. Designed for ease of use, the zone triggering function allows engineers to quickly separate a signal for observation with a simple rectangle drawing gesture. Unlike traditional triggering methods, this function doesn't require the waveform to be completely stable; it can capture a signal that meets specific conditions and stabilize it for triggering, saving time and improving efficiency.
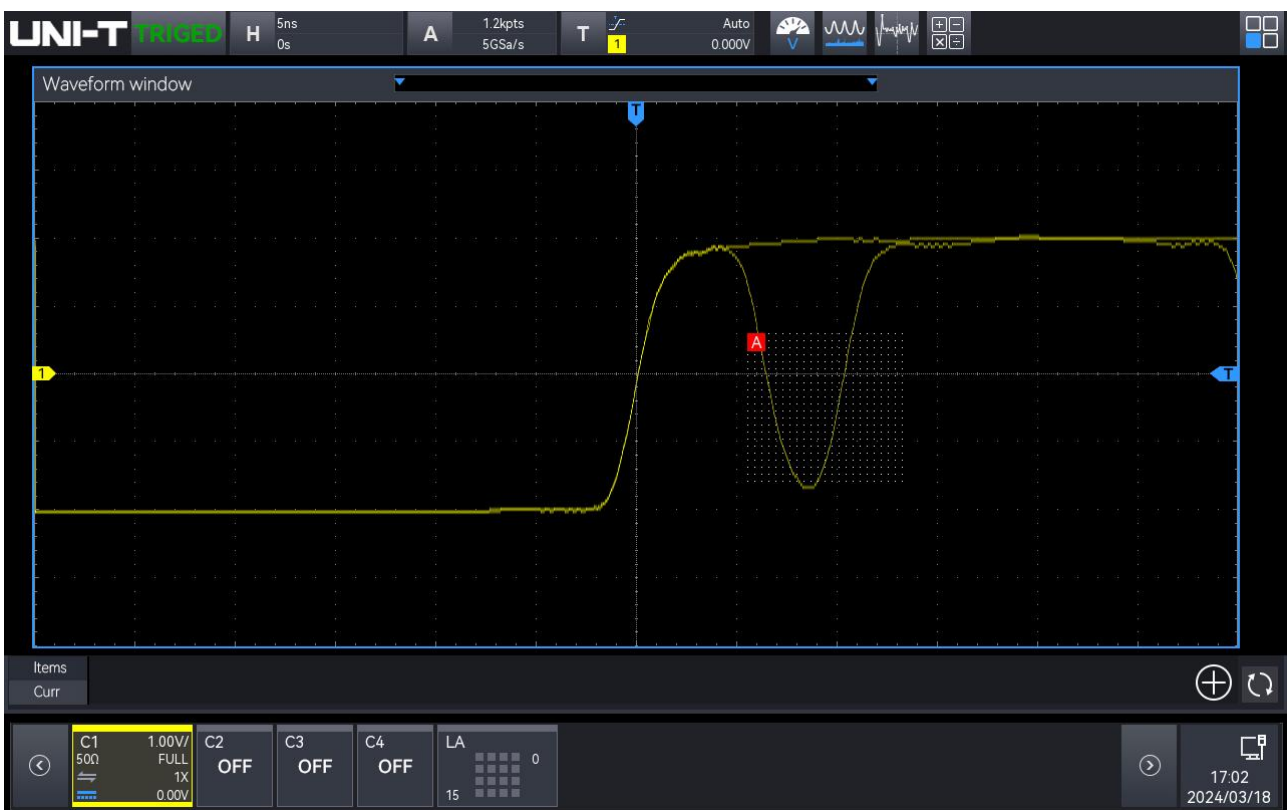


# Various connections

MSO2000X series offers a wide range of connection with flexibility and convenience.

USB 3.0 host ports on the front and rear panel that allow you to easily transfer screenshots, detailed instrument configuration information and waveform data to a storage device, and support USB, keyboard and mouse access for intuitive data entry and control.

USB 3.0 device port on the rear-panel allows you to remotely control the oscilloscope from a PC. The HDMI port allows the oscilloscope's high-resolution display to be projected in real time on other external monitors, ideal for teaching and teamwork.

# Webserver

- SCPI for remote control

- Remotely check and control

- Export waveform file

- Browse user manual on-line

- PC/Mobile phone access

# Performance Characteristics

All specifications are guaranteed, except those marked "typical".

Unless otherwise stated, all the Performance Characteristics are suitable for the probe that the attenuation switch set to 10x and MSO2000X series mixed signal oscilloscope.

To meet these specifications, the oscilloscope should first meet the following conditions.

- The instrument must be operated continuously for at least thirty minutes at the specified operating temperature.

- The self-calibration must be performed when the operating temperature reaches or exceeds 5 °C.

| Model | MSO2304X | MSO2204X | MSO2104X |
|---|---|---|---|
| Analog bandwidth | 300 MHz | 200 MHz | 100 MHz |
| Calculated rise time (10 to 90%) (typical) | ≤1.17 ns | ≤1.80 ns | ≤3.50 ns |
| Input/output channel number | 4 analog channels | | |
| | 16 digital channels | | |
| | 2-channel signal output | | |
| Sampling mode | Real-time sampling | | |
| Acquisition mode | Normal, peak detect, high resolution, averaging, sequential sampling | | |
| ERES | Enhanced bit: 1, 1.5, 2, 2.5, 3, 4 (8 to 12-bit) | | |
| Maximum sample rate | Analog channel: 5 GSa/s (interweave mode), 2.5 GSa/s (non-interweave mode) Digital channel: 1.25 GSa/s | | |
| Average | After all channels have reached N samples simultaneously, the number of N times can be selected from 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192. | | |
| Memory depth | Auto (limit to 10 Mpts), 25 kpts, 250 kpts, 500 kpts, 5 Mpts, 50 Mpts, 100 Mpts | | |
| Maximum waveform capture rate | 500,000 wfms/s | | |
| | 2,000,000 wfms/s (sequence mode) | | |
| Sequential sampling | Maximum 125,000 frames, minimum two trigger interval < 500 ns | | |
| Hardware real-time waveform recording | 125,000 frames | | |

| | |
|---|---|
| and playing | |
| Screen | 10.1-inch 1280x800 HD capacitive touch screen |

**Vertical System (Analog channel)**

| | |
|---|---|
| Input coupling | DC, AC, GND |
| Input impedance | (1 MΩ±2%) ‖ (16 pF±3 pF) <br> 50 Ω± 1.5% |
| Probe attenuation factor | Voltage probe ratio: 0.001X, 0.01X, 0.1X, 1X, 10X, 100X, 1000X, Custom <br> Current probe ratio: 5 mV/A, 10 mV/A, 50 mV/A, 100 mV/A, 200 mV/A, <br> 500 mV/A, 1V/A, Custom |
| Maximum input voltage | 1MΩ: 400 V (DC+ACVpk) 135 $V_{RMS}$ <br> 50 Ω: 5 $V_{RMS}$ Max |
| Vertical resolution | 8-bit (ERES is enabled with a maximum of 12-bit) |
| Vertical scale | 500 μV/div to 10 V/div (1 MΩ) <br> 500 μV/div to 1 V/div (50 Ω) |
| Offset range | 500 μV/div to 50 mV/div: ±2 V (50 Ω and 1 MΩ) <br> 100 mV/div to 1 V/div: ±5 V (50 Ω) <br> 100 mV/div to 1 V/div: ±25 V (1 MΩ) <br> 2 V/div to 10 V/div: ±250 V (1 MΩ) <br> Vertical offset reading: V |
| Band limit (typical) | 50 Ω: 20 MHz, Full, Custom <br> 1 MΩ: 20 MHz, Full, Custom |
| Low-frequency response | (AC coupling, -3 dB); ≤5 Hz (on BNC) |
| DC gain accuracy | <5 mV: ±3% full scale, ≥5 mV: ±2% full scale |
| DC offset accuracy | ±(2%+0.1 div+2 mV) |
| Unit | W, A, V, and U. default: V |
| Channel-to-channel isolation(typical) | DC to maximum bandwidth: >40 dB |

**Digital channel**

| | |
|---|---|
| Threshold | 8-channel in one group |
| Threshold selection | TTL (1.4 V) <br> 5.0 V CMOS (+2.5 V), 3.3 V CMOS (+1.65 V) <br> 2.5 V CMOS (+1.25 V), 1.8 V CMOS (+0.9 V) <br> ECL (-1.3 V) <br> PECL (+3.7 V) |

| | |
|---|---|
| | LVDS (+1.2 V) |
| | 0 V |
| | Custom |
| Threshold range | ±20.0 V, 20 mV stepping |
| Threshold accuracy | ±(100 mV + threshold setting of 3%) |
| Dynamic range | ±10 V + threshold |
| Input impedance | (101 kΩ±1%) ‖ (9 pF ± 1 pF) |
| Minimum voltage swing | 500 mVpp |
| Minimum detectable pulse width(typical) | 800 ps |
| Vertical resolution | 1 bit |
| Channel-to-channel deskew range | ±100 ns |
| **Horizontal System (Analog channel)** | |
| Time base range | 100 MHz (2 ns/div to 1 ks/div) |
| | 200 MHz (2 ns/div to 1 ks/div) |
| | 300 MHz (1 ns/div to 1 ks/div) |
| | (simultaneously display the current sampling rate and memory depth) |
| Time base accuracy | ±1 ppm (original accuracy); ±1 ppm (the aging rate of first year); ±3.5ppm (the aging rate of ten years) |
| Time base delay time range | Pre-trigger (negative delay) ≥ 1 screen width |
| | Post-trigger (positive delay): 1 s to 5 ks |
| Time base mode | Y-T (default) |
| | X-Y (CH1-CH2, CH1-CH3, CH1-CH4, CH2-CH3, CH2-CH4, CH3-CH4) |
| | Roll, time base ≥ 50 ms/div, using the horizontal rotary knob to enter or exit Roll mode |
| | Scan, time base ≥ 50 ms/div, user can select Roll or Scan mode |
| **Trigger** | |
| Trigger Sensitivity | CH1 to CH4: |
| | ≤10mV/div, The larger value of 1div or 5mVpp |
| | >10mV/div, 0.5div |
| | EXT: |
| | 400mVpp, DC to 10MHz |
| | 800mVpp, 10MHz to External trigger bandwidth frequency (250 MHz) |

|  | Enable the noise rejection, with trigger sensitivity reducing half |
|---|---|
| Trigger level range | Internal: ± 5 div from the center of the screen<br>EXT: ± 7 V |
| Trigger modes | Auto, Normal, Single |
| Trigger holdoff range | 0 ps to 10 s |
| Trigger coupling（typical） | DC: all signal can pass |
|  | AC: block DC component of input signal |
|  | HF reject: suppress high-frequency components of signals above 40 kHz |
|  | LF reject: suppress low-frequency components of signals below 40 kHz |
| Noise reject | Suppress the high-frequency noise of signal, to reduce the error-touched possibility |

| **Zone Triggering** | |
|---|---|
| Zone | 2 Zones; source: CH1 to CH4; feature: Must Intersect, Must Not Intersect |

| **Edge** | |
|---|---|
| Slope | Rising, Falling, Either |
| Source | CH1 to CH4, AC Line, EXT, D0 to D15 |

| **Runt** | |
|---|---|
| When | >, <, ≤ ≥, None |
| Polarity | Positive, Negative |
| Pulse width | 3.2 ns to 10 s |
| Source | CH1 to CH4, D0 to D15 |

| **Window** | |
|---|---|
| Polarity | Rising, Falling, Any |
| When | Enter, Exit, Time |
| Set | 3.2 ns to 10 s |
| Source | CH1 to CH4 |

| **Nth edge** | |
|---|---|
| Slope | Rising, Falling |
| Idle time | 3.2 ns to 10 s |
| Edge number | 1 to 65535 |
| Source | CH1 to CH4, D0 to D15 |

| **Delay** | |
|---|---|
| Edge type | Rising, Falling |
| When | >, <, ≤ ≥, > < |
| Delay time | 3.2 ns to 10 s |

| | |
|---|---|
| Source | CH1 to CH4, D0 to D15 |
| **Timeout** | |
| Slope | Rising, Falling, Any |
| Timeout | 3.2 ns to 10 s |
| Source | CH1 to CH4, D0 to D15 |
| **Duration** | |
| Code pattern | H, L, X |
| When | >, <, ≤  ≥ |
| Duration | 3.2 ns to 10 s |
| Source | CH1 to CH4, D0 to D15 |
| **Setup and Hold** | |
| Clock edge | Rising, Falling |
| Data type | H, L |
| Setup | 3.2 ns to 10 s |
| Hold | 3.2 ns to 10 s |
| Source | CH1 to CH4, D0 to D15 |
| **Pulse width** | |
| Polarity | Positive, Negative |
| When | >, <, ≤  ≥ |
| Pulse Width | 0.8 ns to 4 s |
| Source | CH1 to CH4, AC Line, EXT, D0 to D15 |
| **Slope** | |
| Slope | Positive, Negative |
| When | >, <, ≤  ≥ |
| Time | 3.2 ns to 1 s |
| Source | CH1 to CH4 |
| **Video** | |
| Standard | PAL, NTSC, SECAM, 525p/60, 625p/50, 720p/24, 720p/25, 720p/30, 720p/50, 720p/60, 1080i/25, 1080i/30, 1080p/24, 1080p/25, 1080p/30, 1080pfs/24 |
| Source | CH1 to CH4 |
| **Pattern** | |
| Code pattern | H, L, X, Rising, Falling |
| Source | CH1 to CH4, D0 to D15 |
| **RS232/UART** | |
| When | Start, FrameErr, CheckErr, Data |
| Baud rate | 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 |

| | |
|---|---|
| | bps, custom |
| Data bit | 5 bits, 6 bits, 7 bits, 8 bits |
| Source | CH1 to CH4, D0 to D15 |
| **I2C** | |
| When | Start, Restart, Stop, Loss, Address, Data, Address & Data |
| Addr mode | 7 bits, 10 bits |
| Addr range | 0 to 7F, 0 to 3 FF |
| Byte length | 1 to 5 |
| Source | CH1 to CH4, D0 to D15 |
| **SPI** | |
| Mode | Timeout, CS |
| When | Start, Data |
| Timeout | 100 ns to 1 s |
| Data bit | 4 bits to 32 bits |
| Source | CH1 to CH4, D0 to D15 |
| **CAN** | |
| Signal type | CAN_H, CAN_L |
| When | Start, Data Frame, Remote Frame, Error Frame, Over-Load, Identifier, Data, Identifier & Data, End of Frame, Missing Ack, Bit Error, CRC Error, ALL Errors |
| Data rate | 10 kbps, 19.2 kbps, 20 kbps, 33.3 kbps, 38.4 kbps, 50 kbps, 57.6 kbps, 62.5 kbps, 83.3 kbps, 100 kbps, 115.2 kbps, 125 kbps, 230.4 kbps, 250 kbps, 490.8 kbps, 500 kbps, 800 kbps, 921.6 kbps, 1 Mbps, 2 Mbps, 3 Mbps, 4 Mbps, 5 Mbps, custom |
| Source | CH1 to CH4, D0 to D15 |
| **CAN-FD** | |
| Signal type | CAN_H, CAN_L |
| When | Start, Data Frame, Remote Frame, Error Frame, Over-Load, Identifier, Data, Identifier & Data, End, Lost, Bit Error, CRC Error, ALL Errors |
| Data rate | 10 kbps, 19.2 kbps, 20 kbps, 33.3 kbps, 38.4 kbps, 50 kbps, 57.6 kbps, 62.5 kbps, 83.3 kbps, 100 kbps, 115.2 kbps, 125 kbps, 230.4 kbps, 250 kbps, 490.8 kbps, 500 kbps, 800 kbps, 921.6 kbps, 1 Mbps, 2 Mbps, 3 Mbps, 4 Mbps, 5 Mbps, custom |
| FD data rate | 250 kbps, 500 kbps, 800 kbps, 1 Mbps, 1.5 Mbps, 2 Mbps, 4 Mbps, 5 Mbps, 6 Mbps, 8 Mbps, custom |
| Source | CH1to CH4, D0 to D15 |
| **LIN** | |
| Trigger condition | Sync, Identifier, Data, Identifier & Data, Wake Frame, Sleep Frame, Error |

| Version | v1.x, v2.x, Either |
|---|---|
| Baud rate | 1.2 kbps, 2.4 kbps, 4.8 kbps, 9.6 kbps, 10.417 kbps, 19.2 kbps, 20 kbps, custom |
| Data length | 1 to 8 |
| Source | CH1 to CH4, D0 to D15 |
| **FlexRay** | |
| When | Start, Indicators, Identifier, Cycle, Heade, Data, Identifier & data, End frame, Error |
| Polarity | BM, BDiff/BP |
| Baud rate | 2.5M bps, 5M bps, 10M bps, custom |
| Source | CH1 to CH4, D0 to D15 |
| **Audio** | |
| When | Word, Left, Right, Either |
| Format | Standard, Left Aligned, Right Aligned, TDM |
| Source | CH1 to CH4, D0 to D15 |
| **SENT** | |
| When | Fast: Sync, Status, Data, CRC, STAT+Data, S&D+CRC, F_ CRC Error, CONT Pul Err<br>Slow: Sync, Short ID, Short Data, Short CRC, Short ID & data, Enh ID, Enh Data, Enh CRC, Enh ID & data, SLO CH CRC error |
| Source | CH1 to CH4, D0 to D15 |
| **Decoding** | |
| Number of decodes | 4 |
| Decoding type | Standard: RS232/UART, I2C, SPI |
| | Option: CAN, CAN-FD, LIN, FlexRay, Audio, SENT |
| Parallel | Up to 18 bits parallel bus decoding, supports the combination of analog channel and digital channel and supports custom time setting |
| Source | CH1 to CH4, D0 to D15 |
| **Measurement** | |
| Cursor | Voltage difference between cursors ($\triangle$Y)<br>Time difference between cursors ($\triangle$X)<br>Reciprocal of $\triangle$X (Hz) (1/$\triangle$X) |
| | Voltage and time of waveform point |
| | Display the cursor in the automatic measurement |
| Automatic measurements | **Analog channel: 54 kinds of parameters**<br>Maximum, Minimum, Top, Base, Amplitude, Middle, Peak-Peak, Average, Average-Cycles, RMS, RMS-Cycles, AC RMS, AC RMS-Cycles, Area, |

| | |
|---|---|
| | Area-Cycles, +Area, –Area, +Area-Cycles, –Area-Cycles, +Overshoot, –Overshoot, +Preshoot, –Preshoot, Period, Frequency, Rise time, Fall time, +Width, –Width, +Duty, –Duty, +Pulse count, –Pulse count, Rising edge count, Falling edge count, Burst width, Burst Interval, Burst Period, Burst Per count, Ratio, Period Ratio, Setup time, Hold time, Setup & Hold Ratio, FRFR, FRFF, FFFR, FFFF, FRLF, FRLR, FFLR, FFLF, Phase(r-r), Phase(f-f)<br><br>**Digital channel: 10 kinds of parameters**<br><br>Frequency, Period, +Width, –Width, +Duty, –Duty, rising delay A→B, falling delay A→B, phase A→B, phase B→A |
| Measurement mode | Common measurement and accuracy measurement (Full memory hardware measurements) |
| Measurement type | Simultaneously display 27 kinds of parameter measurement |
| Measurement range | Main time base, Zoom time base, Cursor area |
| Measurement statistics | Mean, Maximum, Minimum, Std Dev, Count, Tendency chart, Histogram |
| XY measurement | Time, Cartesian, Polar, Product, Ratio |
| Analysis | Frequency Counter, DVM, Pass/Fail, Waveform recording, Bode plot, Power Analysis |
| **Math** | |
| Waveform math | A+B, A-B, A×B, A÷B, advanced, Filter |
| Filter | Low pass, High pass, Band pass, Band stop |
| Operation | 0,1,2,3,4,5,6,7,8,9, (+, -, *, /, ^, >, <, &&, ‖, ==, !=) |
| Function | sin, cos, sinc, tan, sqrt, exp, lg, ln, floor, abs, acos, asin, atan, sinh, tanh, ceil, cosh, fabs, intg, diff |
| **FFT** | |
| Channel number | 4 |
| Window types | Hanning, Hamming, Rectangle, Blackman |
| FFT count | Up to 4 Mpts |
| FFT vertical scale | Vrms, dB |
| FFT | Waterfall: ON, OFF |
| | Spectrum range: Start frequency, Stop frequency, Center frequency, Span |
| | Four traces: Normal, Average, Max Hold, Min Hold |
| | Marker: Marker type, Marker Points, Marker list |
| **Storage** | |
| Setting | Set Status (.set) |
| Waveform | Waveform data (*.dat) (*.csv) |

| Image | Image storage (*.bmp) (*.png) (*.jpg) |
|---|---|
| Report | Decoding Event List (*.csv) (*.pdf) (*.html) |
| **Function/AWG Gen (Option)** | |
| Channel | 2 |
| Sample rate | 250 MSa/s |
| Vertical resolution | 16-bit |
| Maximum frequency | 50 MHz |
| Standard | Sine, Square, Ramp, Noise, DC and Arbitrary wave |
| Built-in arbitrary | 200 types including Sinc, ExpRise, ExpFall, Cardiac, Gauss, Lorentz, and HaverSine |
| Sine wave | Frequency range: 1 µHz to 50 MHz |
| | Flatness: ±0.5 dB (relative 1 kHz) |
| | Harmonic distortion: -40 dBc |
| | Non-harmonic spurious (typ): -40 dBc |
| | Total harmonic distortion: 1% (DC to 20 kHz, 1Vpp) |
| | SNR: 40 dB |
| Square wave/Pulse wave | Frequency range<br>Square wave: 1 µHz to 15 MHz; Pulse wave: 1 µHz to 15 MHz |
| | Rising/falling time: <13 ns (typical 1kHz, 1Vpp, 50 Ω) |
| | Overshoot: typical 2% (1 kHz, 1 Vpp, 50 Ω) |
| | Duty ratio<br>Square wave: 1% to 99%, adjustable; Pulse wave: 1% to 99%, adjustable |
| | Resolution of duty ratio: 1% or 10 ns (take the greater value of both) |
| | Minimum pulse width: 20 ns |
| | Resolution of pulse width: 10 ns |
| | Jitter: 2 ns |
| Ramp wave | Frequency range: 1 µHz to 400 kHz |
| | Linearity: 1% |
| | Symmetry: 0.1% to 99.9% |
| Noise | Bandwidth: 50 MHz (typical) |
| Arbitrary wave | Frequency range: 1 µHz to 5 MHz |
| | Waveform length: 8 k |
| | Internal save position: 200 |
| Frequency | Accuracy: ±1 ppm (original accuracy); ±1ppm (the aging rate of first year); ± |

|  | 3.5ppm (the aging rate of ten years) |
| --- | --- |
|  | Resolution: 1 μHz |
| Amplitude | Output range: 20 mVpp to 6 Vpp (high resistance); 10 mVpp to 3 Vpp (50 Ω) |
|  | Resolution: 1 mV |
|  | Accuracy (Typical value: 1 kHz, sine wave, 0V, deviation): ± (5%+2 mVpp) |
| DC offset | Range: ±3 V (high resistance); ±1.5 V (50 Ω) |
|  | Resolution: 1 mV |
|  | Accuracy: ± (offset set value 5%+2 mV) |
| **AM** | |
| Carrier wave | Sine, Square, Ramp, Arbitrary wave |
| Source | Internal |
| Modulated wave | Sine, Square, Rising ramp, Falling ramp, Noise, Arbitrary wave |
| Modulation frequency | 2 mHz to 50 kHz |
| Modulation depth | 0% to 120% |
| **FM** | |
| Carrier wave | Sine, Square, Ramp, Arbitrary wave |
| Source | Internal |
| Modulated wave | Sine, Square, Rising ramp, Falling ramp, Noise, Arbitrary wave |
| Modulation frequency | 2 mHz to 50 kHz |
| Deviation | 12.5 MHz (maximum) |
| **ASK** | |
| Carrier wave | Sine, Square, Ramp, Arbitrary wave |
| Modulated wave | Square wave (Duty ratio 50%) |
| Modulation frequency | 2 mHz to 50 kHz |
| **FSK** | |
| Carrier wave | Sine, Square, Ramp, Arbitrary wave |
| Modulated wave | Square wave (Duty ratio 50%) |
| Modulation frequency | 2 mHz to 50 kHz |
| Hopping frequency | Any frequency within the range of the Carrier wave signal |
| **Sweep** | |
| Mode | Linear, Logarithmic |

| | |
|---|---|
| Sweep time | 1 ms to 500 s |
| Start and stop frequency | Any frequency within the range of the waveform |
| **Display** | |
| Screen | 10.1-inch multi-touch capacitive screen |
| Resolution | 1280×RGB×800 vertical pixel |
| Color | 24-bit true colors |
| Persistence | Auto, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 5 s, 10 s, 20 s, infinite, close |
| Display type | Point, Vector |
| Real-Time clock | Time and data (user-defined) |
| Waveform Intensity | 1% to 100% (default 50%) |
| Grid Intensity | 0% to 100% (default 50%) |
| Backlight Intensity | 1% to 100% (default 50%) |
| Transparent | 0% to 100% (default 50%) |
| **Bode plot (Included with AWG Option)** | |
| Start frequency | 50 Hz to 50 MHz |
| Stop frequency | 60 Hz to 50 MHz |
| Count | 1 to 1000 |
| Amplitude | High resistance: 20 mVpp to 6 Vpp<br>50Ω: 10 mVpp to 3 Vpp |
| **DVM (typical)** | |
| Source | Analog channel |
| Mode | DC, AC+DC RMS, AC RMS |
| Resolution | 4-bit |
| Buzzer | Beeps when the specified limit values are reached or exceeded |
| **Frequency Counter** | |
| Source | any analog channel and digital channel |
| Measurement | Frequency, Period, Totalizer |
| Counter | The maximum effective digits are 7, and the refresh time and effective digits are adjustable. |
| Maximum measurement frequency | Maximum bandwidth of analog channel |
| Time reference | Internal reference: ±1 ppm (original accuracy); ±1ppm (the aging rate of first year); ±3.5ppm (the aging rate of ten years) |

## Interface

| | |
|---|---|
| USB-Host 3.0 | 1 on the front panel, 2 on the rear panel |
| USB-Device 3.0 | 1 on the rear panel |
| LAN | LAN (VXI11), 10/100/1000 Base, RJ-45 |
| AUX Out | Trig Out, Pass/Fail, DVM |
| Gen Out | 2 on the front panel |
| 10MHz reference input | 50 Ω, amplitude 400 mVpp to 4.5 Vpp (-3.979 dBm, 17.044 dBm), frequency 10 MHz ±10 ppm |
| 10MHz reference output | 50 Ω, 1.65 Vpp square wave |
| HDMI[1] | 1 port for external display or projector |

## General technical specification

### Probe compensator output

| | |
|---|---|
| Output voltage | 3 Vpp |
| Frequency | 10 Hz ,100 Hz, 1 kHz (default), 10 kHz |

## Power Source

| | |
|---|---|
| Power source voltage | 100 V to 240 VAC (fluctuate: ±10%), 50 Hz/60 Hz<br>100 V to 120 VAC (fluctuate: ±10%), 400 Hz |
| Power consumption | 120 W Max |
| Fuse | 3 A, F-class, 250 V |

## Environmental

| | |
|---|---|
| Temperature | Operating: 0°C to +40°C |
| | Non-operating: -20°C to +70°C |
| Cooling | Forced cooling by fan |
| Humidity | Operating: below +35 °C, relative humidity ≤90%; non-operating: +35 °C to +40 °C, relative humidity ≤60% |
| Altitude | Operating: below 3,000 meters; non-operating: below 15,000 meters |
| Pollution degree | 2 |
| Operating environment | Indoor |

## Mechanical Specifications

| | |
|---|---|
| Dimension (W×H ×D) | 378 mm×218 mm×120 mm |
| Weight | 3.83 kg |

## Calibration interval

| | |
|---|---|
| Calibration | 1 year |

interval

## Safety Regulations

| | Compliance with EMC directive (2014/30/EU), compliance with or superior to IEC 61326-1:2021/ EN61326-1:2021, IEC 61326-2-1:2021/ EN61326-2-1:2021 | | |
|---|---|---|---|
| Electromagnetic compatibility | Conducted disturbance | CISPR 11/EN 55011 | CLASS B group 1, 150 kHz-30 MHz |
| | Radiation disturbance | CISPR 11/EN 55011 | CLASS B group 1, 30 MHz-1 GHz |
| | (ESD) | IEC 61000-4-2/EN 61000-4-2 | 4.0 kV (contact), 8.0 kV (air) |
| | Radio sensitivity | 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 transient (EFT) | IEC 61000-4-4/EN 61000-4-4 | 2kV (AC input) |
| | Surge | IEC 61000-4-5/EN 61000-4-5 | 1kV (live to zero) 2kV (live/zero to ground) |
| | Radio continuous sensitivity | IEC 61000-4-6/EN 61000-4-6 | 3V, 0.15-80 MHz |
| | Voltage dip and short-term interruption | IEC 61000-4-11/EN 61000-4-11 | Voltage dip: 0% UT during 1 cycle; 40% UT during 10/12 cycles; 70% UT during 25/30 cycles Short-term interruption: 0% UT during 250/300 cycles |
| Safety specification | 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 | | |

Remarks

1: only support standard HDMI, not support other adapters.

# Order information

|  | Description | Order No. |
|---|---|---|
| Model | MSO2304X (300 MHz, 5 GSa/s, 4 analog channels) | MSO2304X |
|  | MSO2204X (200 MHz, 5 GSa/s, 4 analog channels) | MSO2204X |
|  | MSO2104X (100 MHz, 5 GSa/s, 4 analog channels) | MSO2104X |
| Standard accessories | National standard power cable x 1 |  |
|  | USB3.0 cable x 1 | UT-D30 |
|  | BNC-BNC direct-through line x 1 | UT-L45 |
|  | BNC-red and black alligator connecting wire x 1 | UT-L02A |
|  | Passive probe (300 MHz/200 MHz/100 MHz) x 4 | UT-P06/UT-P05/UT-P04 |
| Optional accessories | 100MHz Upgrade to 300MHz Bandwidth | MSO2000X-BW1MT3M |
|  | 200MHz Upgrade to 300MHz Bandwidth | MSO2000X-BW2MT3M |
|  | 100MHz Upgrade to 200MHz Bandwidth | MSO2000X-BW1MT2M |
|  | All serial bus triggering and decoding options | MSO2000X-BND |
|  | Automobile serial bus triggering and decoding option (CAN, CAN-FD, LIN, FlexRay, SENT) | MSO2000X-AUTO |
|  | Automotive serial bus triggering and decoding option CAN | MSO2000X-CAN |
|  | Automotive serial bus triggering and decoding option CAN-FD | MSO2000X-CAN-FD |
|  | Automotive serial bus triggering and decoding option LIN | MSO2000X-LIN |
|  | Automotive Serial Bus Trigger and decoding Option FlexRay | MSO2000X-FLEX |
|  | Automotive sensor serial bus triggering and decoding option SENT | MSO2000X-SENT |
|  | Audio serial bus triggering and decoding option Audio | MSO2000X-AUDIO |
|  | Dual channel function/arbitrary waveform generator (includes Bode Plot Analyzer) | MSO2000X-AWG |
|  | Power analysis | MSO2000X-PWR |
|  | Isolation transformer | UT-ISOT |
|  | High voltage probe | UT-V23/UT-P21/UT-P20 |
|  | High voltage differential probe | UT-P30/UT-P31/UT-P32/ UT-P33/UT-P35/UT-P36 |
|  | Current probe | UT-P40/UT-P41/UT-P42/ |

| | |
|---|---|
| | UT-P43/UT-P44/UT-P4030D/UT-P4150/UT-P4500/P4100A/P4100B |
| 16-channel logic analyzer probe | UT-M15 |

Remarks: Please order all instruments, accessories and options from your local UNI-T distributor.

# Oscilloscope probes and accessories

## Passive probe

| Model | Type | |
|---|---|---|
| UT-P01  | High resistance probe | 1X: DC to 8 MHz<br>10X: DC to 25 MHz<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P03  | High resistance probe | 1X: DC to 8 MHz<br>10X: DC to 60 MHz<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P04  | High resistance probe | 1X: DC to 8 MHz<br>10X: DC to 100 MHz<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P05  | High resistance probe | 1X: DC to 8 MHz<br>10X: DC to 200 MHz<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P06  | High resistance probe | 1X: DC to 8 MHz<br>10X: DC to 300 MHz<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P07A  | High resistance probe | 10X: DC to 500 MHz<br>Input resistance: 10 MΩ<br>Maximum of operating voltage: <600V pk<br>Oscilloscope compatibility:<br>all series of UNI-T |

| UT-P08A | High resistance probe | 10X: DC to 350 MHz<br>Input resistance: 10 MΩ<br>Maximum of operating voltage: <600V pk<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P20 | High resistance probe | DC to 100 MHz<br>Probe coefficient 100:1<br>Maximum of operating voltage: 1500 Vrms<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-V23 | High voltage probe | DC to 100 MHz<br>Probe coefficient 100:1<br>Input resistance: 100 MΩ±2%<br>Maximum of operating voltage: 2000 Vpp<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P21 | High voltage probe | DC to 50 MHz<br>Probe coefficient 1000:1<br>Maximum operating voltage: DC 15 kVrms. AC 10kV (sine wave)<br>Oscilloscope compatibility:<br>all series of UNI-T |

# Current probe

| Model | Type | |
| --- | --- | --- |
| UT-P40 | Current probe | DC to 100 kHz<br>Range: 50 mV/A, 5 mV/A<br>Current range: 0.4 A to 60 A<br>Maximum of operating voltage: 600 Vrms<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P41 | Current probe | DC to 100 kHz<br>Range: 100 mV/A, 10 mV/A<br>Current range: 0.4 A to 100 A<br>Maximum of operating voltage: 600 Vrms<br>Oscilloscope compatibility:<br>all series of UNI-T |

| UT-P42 | | |
|---|---|---|
| | Current probe | DC to 150 kHz |
| | | Range: 100 mV/A, 10 mV/A |
| | | Current range: 0.4 A to 200 A |
| | | Maximum of operating voltage: 600 Vrms |
| | | Oscilloscope compatibility: all series of UNI-T |
| UT-P43 | | |
| | Current probe | DC to 25 MHz |
| | | Range: 100 mV/A |
| | | Maximum test current: 20 A |
| | | Rising time: 14 ns |
| | | Oscilloscope compatibility: all series of UNI-T |
| UT-P44 | | |
| | Current probe | DC to 50 MHz |
| | | Range: 50 mV/A |
| | | Maximum test current: 40 A |
| | | Rising time: 7 ns |
| | | Oscilloscope compatibility: all series of UNI-T |
| UT-P4030D | | |
| | High-frequency current probe | Bandwidth: DC to 100 MHz |
| | | Rising time: ≤3.5 ns |
| | | Range selection: 30 A/5 A |
| | | Maximum test current: 30A |
| | | Voltage of insulated line: 300V CAT I |
| | | Oscilloscope compatibility: all series of UNI-T |
| UT-P4150 | | |
| | High-frequency current probe | Bandwidth: DC to 12 MHz |
| | | Rising time: ≤29 ns |
| | | Range selection：150 A/30 A |
| | | Maximum test current: 150 A |
| | | Voltage of insulated line: 600V CAT II 300 V CAT III |
| | | Oscilloscope compatibility: all series of UNI-T |
| UT-P4500 | | |
| | High-frequency current probe | Bandwidth: DC to 5 MHz |
| | | Rising time: ≤70 ns |
| | | Range selection: 500 A/75 A |
| | | Maximum test current: 500 A |
| | | Voltage of insulated line: 600V CAT II 300 V CAT III |
| | | Oscilloscope compatibility: |

| | | all series of UNI-T |
|---|---|---|
| UT-P4100A  | Low-frequency current probe | Bandwidth: DC to 600 kHz<br>Rising time: ≤583 ns<br>Maximum test current: 100 A<br>Range selection: 100 A/10 A<br>Range sensitivity: 0.1 V/A, 0.01 V/A<br>Common-mode voltage RMS: CAT I 600 V<br>CAT II 600V CAT III 300V<br>Oscilloscope compatibility:<br>all series of UNI-T |
| UT-P4100B  | Low-frequency current probe | Bandwidth: DC to 2 MHz<br>Rising time: ≤175 ns<br>Maximum test current: 100 A<br>Range selection: 100 A/10 A<br>Range sensitivity: 0.1 V/A, 0.01 V/A<br>Common-mode voltage RMS: CAT I 600 V<br>CAT II 600 V CAT III 300 V<br>Oscilloscope compatibility:<br>all series of UNI-T |

# Active probe

| Model | Type | |
|---|---|---|
| UT-P30  | High voltage differential probe | DC to 100 MHz<br>Attenuation ratio: 100:1, 10:1<br>Input differential-mode voltage: ±800Vpp<br>Oscilloscope compatibility: all series of UNI-T |
| UT-P31  | High voltage differential probe | DC to 100 MHz<br>Attenuation ratio: 1000:1, 100:1<br>Input differential-mode voltage: ±1.5 kVpp<br>Oscilloscope compatibility: all series of UNI-T |

| UT-P32 | | |
|---|---|---|
|  | High voltage differential probe | DC to 50 MHz<br>Attenuation ratio: 1000:1, 100:1<br>Input differential-mode voltage: ±3 kVpp<br>Oscilloscope compatibility: all series of UNI-T |
| **UT-P33** | | |
|  | High voltage differential probe | DC to 120 MHz<br>Attenuation ratio: 100:1, 10:1<br>Input differential-mode voltage: ±14 kVpp<br>Oscilloscope compatibility: all series of UNI-T |
| **UT-P35** | | |
|  | High voltage differential probe | DC to 50 MHz<br>Attenuation ratio: 500:1, 50:1<br>Rising time: 7 ns<br>Accuracy: 2%<br>Input differential-mode voltage:<br>    1/50:130 (DC+peakAC)<br>    1/500:1300 (DC+peakAC)<br>Input common-mode voltage:<br>    100 Vrms, CAT I<br>    600 Vrms, CAT II<br>Oscilloscope compatibility: all series of UNI-T |
| **UT-P36** | | |
|  | High voltage differential probe | DC to 50 MHz<br>Attenuation ratio: 2000:1, 200:1<br>Rising time: 3.5 ns<br>Accuracy: 2%<br>Input differential-mode voltage:<br>    1/200:560 (DC+peakAC)<br>    1/2000:5600 (DC+peakAC)<br>Input common-mode voltage:<br>    2800 Vrms, CAT I<br>    1400 Vrms, CAT II<br>Oscilloscope compatibility: all series of UNI-T |

# Options ordering and installation

1. **Purchase options:** Based on your requirements, please purchase the specified function options from Uni-t Sales Personnel and provide the serial number of the instrument that needs the option installed.
2. **Receive certificate:** You will receive the license certificate based on the address provided in the order.
3. **Register and obtain license:** Visit the Uni-t official website license activation session for registration. Use the license key and instrument serial number provided in the certificate to obtain the option license code and license file.
4. **Install the option:** Download the option license file to the root directory of a USB storage device, and connect the USB storage device to the instrument. Once the USB storage device is recognized, the Option Install menu will be activated. Press this menu key to begin installing the option.

# Limited Warranty and Liability

Uni-T guarantees that the Instrument product is free from any defect in material and workmanship within three years from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. If you need warranty service within the warranty period, please contact your seller directly. Uni-T will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device. For the probes and accessories, the warranty period is one year. Visit instrument.uni-trend.com for full warranty information.

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