

UNI-T

MSO8000HD Series Mixed Signal Oscilloscopes

20GSa/s | 8GHz | 2Gpts | 1,000,000wfms/s



QuickStart Guide REV.2.2

June 2026

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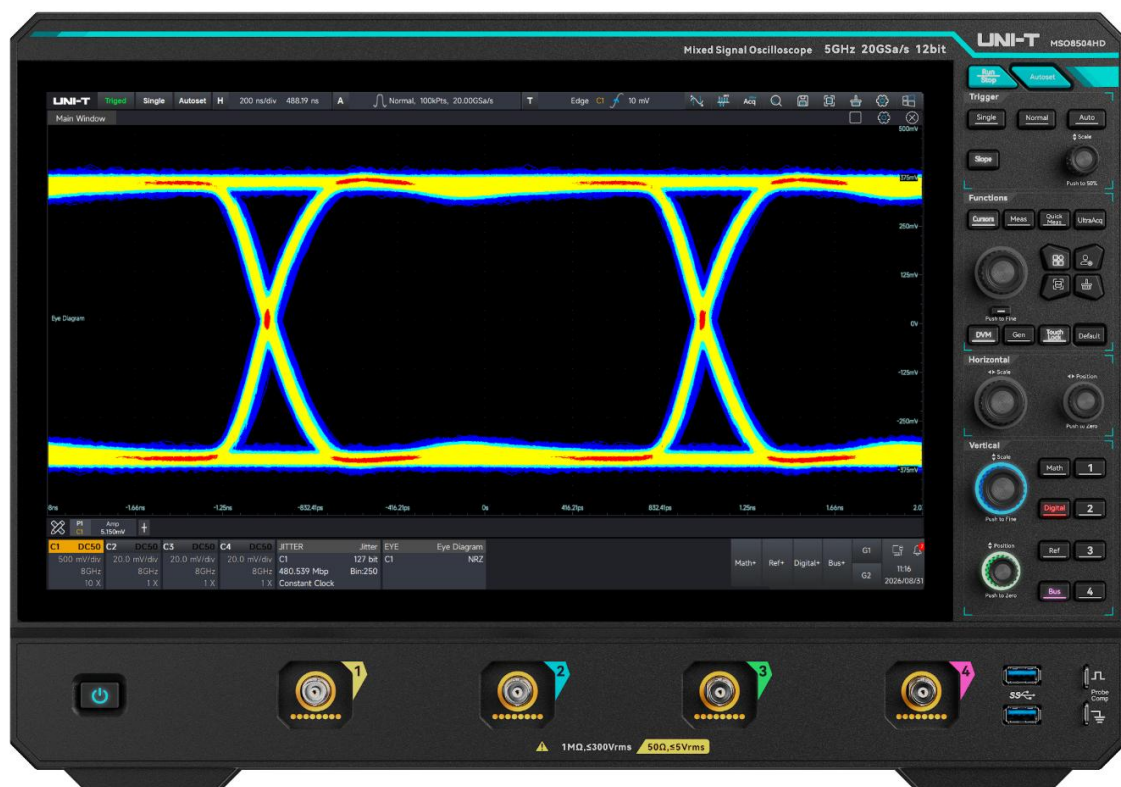
MSO8000HD Series Overview

The MSO8000HD series is a mixed signal oscilloscope newly developed by UNI-T, featuring bandwidths of up to 8GHz and sampling rates of up to 20GSa/s. It is designed for high-speed signal measurement and analysis applications.

The MSO8000HD series adopts UNI-T's proprietary UltraAcq® technology, providing a waveform capture rate of up to 300,000wfms/s and up to 1,000,000wfms/s in sequence mode. Combined with a memory depth of up to 2Gpts, it improves the capability of capturing intermittent signals and analyzing waveform details.

The series supports multiple trigger and decoding types, as well as advanced measurement and analysis functions, including sequence mode, histogram analysis, power analysis, jitter analysis, eye diagram analysis, mask testing, and compliance testing. It supports up to 74 automatic measurement parameters to meet various measurement requirements.

Equipped with a Windows 10 64-bit operating system, the MSO8000HD series provides a stable and extensible system platform. The 15.6-inch high-resolution touchscreen supports multi-window display, split-screen operation, and various gesture controls. The series can be widely used in applications such as communications, aerospace, and education.



The MSO8000HD series mixed signal oscilloscopes include the following models.

Model	Analog Channel	Analog Bandwidth	Logic Analyzer	AWG	Power Analysis	Jitter Analysis	Eye Diagram Analysis
MSO8804HD	4	8GHz	○	○	○	○	○
MSO8604HD	4	6GHz	○	○	○	○	○
MSO8504HD	4	5GHz	○	○	○	○	○

○: Option

Notes:

1. The MSO8604HD and MSO8504HD support DC 1M Ω and AC 1M Ω input coupling modes. The MSO8804HD does not support these modes. This will not be described separately in the following sections.
2. When using the power analysis function, the MSO8804HD requires a high-impedance adapter (UT-OA-1M).

Getting Started Guide

This chapter introduces the initial use of the oscilloscope, the front and rear panels, operation panel, the user interface, and touch screen.

General Inspection

It is recommended to inspect the instrument by following the steps below before using the MSO8000HD series oscilloscopes for the first time.

(1) Check for Damages caused by Transport

If the shipping carton or foam cushioning is severely damaged, contact your UNI-T distributor immediately before using the instrument.

(2) Check Accessories

The details of the supplied accessories are described in the MSO6000HDP Series High-Resolution Oscilloscopes accessories section in this manual. Please refer to this section for the list of accessories. If any accessories are missing or damaged, contact UNI-T or the local distributors.

(3) Machine Inspection

If the instrument appears to be damaged, not working properly, or has failed the functionality test, please contact UNI-T or the local distributors.

If the equipment is damaged during shipping, retain the packaging and notify both the carrier and UNI-T, UNI-T will arrange maintenance or replacement.

Before Use

To perform a quick verification of the instrument's normal operation, please follow the steps below.

1. Connecting the Power Supply

The oscilloscope can be powered by an AC supply of 100V-240V, at 50Hz-60Hz, with a maximum power consumption of 300W. Alternatively, it can be powered by an AC supply of 100V to 120V at 400Hz, with a maximum power consumption of 300W. Alternatively, it can be powered by an AC supply of 100V to 120V at 400Hz, with a maximum power consumption of 300W.

Use the supplied power cord or a power cord that complies with the standards of the country or region where the instrument is used to connect the oscilloscope to the power source.

When the power switch  on the rear panel of the oscilloscope is turned off, the indicator light of the soft power button  in the lower-left corner of the front panel is off, and the soft power button is disabled.

When the rear-panel power switch  is turned on, the indicator light of the soft power button on the lower-left corner of the front panel turns orange. Press the soft power button to power on the oscilloscope.

2. Boot Check

Press the soft power button and the indicator  should change from orange to blue. The oscilloscope will show a boot animation and then enter the normal interface.

3. Connecting the Probe

Connect the supplied probe to the oscilloscope by connecting the probe BNC connector to the C1 input BNC connector. Connect the probe tip to the probe compensation terminal, and connect the probe ground alligator clip to the corresponding ground terminal, as shown in the following figure. The probe compensation signal output provides a waveform with an amplitude of approximately 3Vpp and a default frequency of 1kHz.



Probe Compensation Terminal

Ground Terminal

Probe Compensation Terminal and Ground Terminal

4. Function Check

Press the **Autoset** button, a square waveform with an amplitude of approximately 3Vpp and a frequency of 1kHz should appear on the display.

Return to step 3 and check the other channels using the same procedure. If the displayed square waveform does not match the waveform shown in the above figure, perform the probe compensation procedure described in Step 5 *Probe Compensation*.

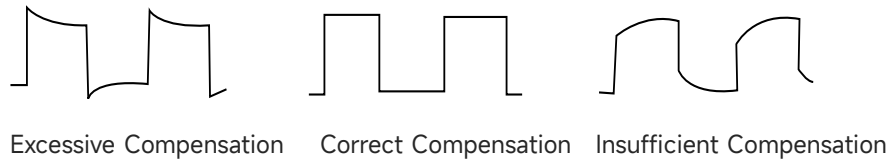
5. Probe Compensation

When the probe is connected to any input channel for the first time, this step might be adjusted to match the probe and the input channel. Probes that are not compensated may lead to measurement errors or mistakes. Please follow the following steps to adjust the probe compensation.

Set the attenuation coefficient in the probe menu to 10X and set the probe switch to 10X. Connect the oscilloscope probe to C1. If using the probe's hook tip, ensure it makes stable contact.

Connect the probe tip to the oscilloscope's probe compensation terminal, and connect the ground alligator clip to the ground terminal of the probe compensation terminal. Enable the C1 channel, and then press the **Autoset** button.

View the displayed waveform, as shown in the following figure.



Probe Compensation Calibration

If the displayed waveform resembles the above Insufficient Compensation or Excessive Compensation, use a non-metallic screwdriver to adjust the probe's variable capacitance until the display matches the Correct compensation waveform.

Warning: To avoid electric shock when using the probe to measure high voltage, please ensure that the probe insulation is in good condition and avoid physical contact with any metallic part of the probe.

Appearance

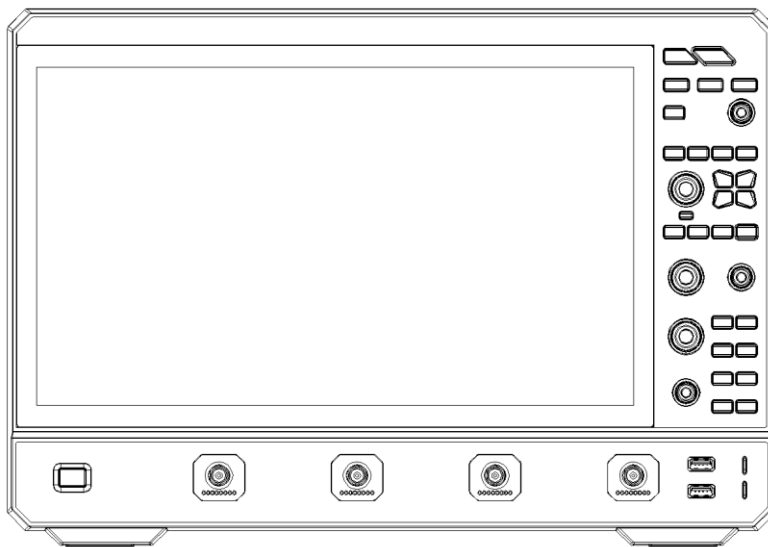


Figure 1 Front View

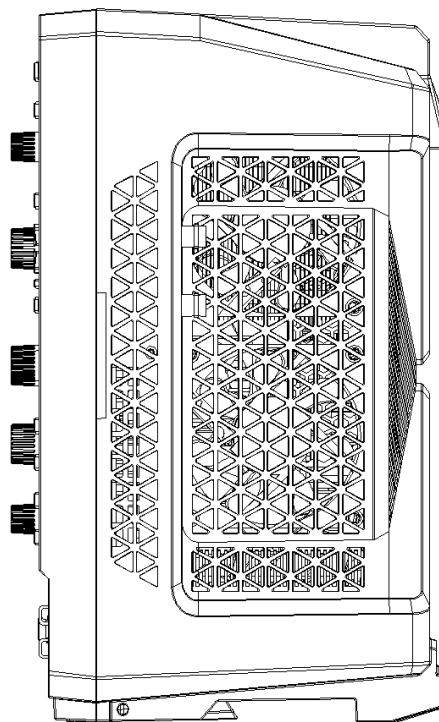


Figure 2 Side View

Front Panel



Figure 3 Front Panel

Table 1 Front Panel Description

No.	Description	No.	Description
1	Display area	8	Vertical controls
2	Run/Stop and Autoset buttons	9	Analog channel buttons
3	Trigger controls	10	Math, Ref, Digital, and Bus buttons
4	Trigger level knob	11	Probe compensation and ground terminals
5	Function controls	12	USB Host
6	Multipurpose knob	13	Analog channel terminals
7	Horizontal controls	14	Soft power button

Rear Panel



Figure 4 Rear Panel

Table 2 Rear Panel Description

No.	Description	No.	Description
1	Function/Arbitrary waveform generator output terminal	9	AC power input and power switch
2	Digital channel input terminal	10	Ground terminal
3	Safety lock	11	External trigger input terminal
4	USB Type-C	12	AUX Out terminal
5	HDMI port	13	AUX In terminal
6	LAN port	14	10MHz Ref Out
7	USB Host port	15	10MHz Ref In
8	USB Device port		

1. Function/Arbitrary waveform generator output terminal: Provides the output connection for the function/arbitrary waveform generator.
2. Digital channel input terminals: Used to connect digital probes for digital channel measurements.
3. Safety lock: A security lock (purchased separately) can be used to secure the oscilloscope to a fixed location through this slot.
4. USB Type-C port
5. HDMI port: Provides a high-definition multimedia interface.
6. LAN port: Connects the oscilloscope to a local area network for remote control.
7. USB Host port: Connects USB-compatible storage devices to the oscilloscope. Storage devices can be used to save or recall waveform files and setup files, save data and screen images, and perform local system software updates when updates are available.
8. USB Device port: A USB 3.0 device interface used for communication between the oscilloscope and a PC.
9. Power switch: After the AC power cord is properly connected to the power source, turn on this power switch to supply power to the oscilloscope. The oscilloscope can then be powered on by pressing the soft power button on the front panel.
The oscilloscope supports AC power supplies of 100V to 240V, 50Hz to 60Hz, or 100V to 120V, 400Hz.
10. Ground terminal: Used to connect the oscilloscope to ground and discharge static electricity.
11. External trigger input terminal
12. Aux Out: 1. Trigger synchronization output; 2. Pass/fail test output; 3. AWG trigger output
13. Aux In: 1. Trigger synchronization input; 2. AWG external trigger input

14. 10MHz Ref Out: A rear-panel BNC connector that outputs the oscilloscope's internal 10 MHz reference clock for clock synchronization with other external instruments.
15. 10MHz Ref In: Provides an external reference clock input for oscilloscope sampling synchronization.

User Interface

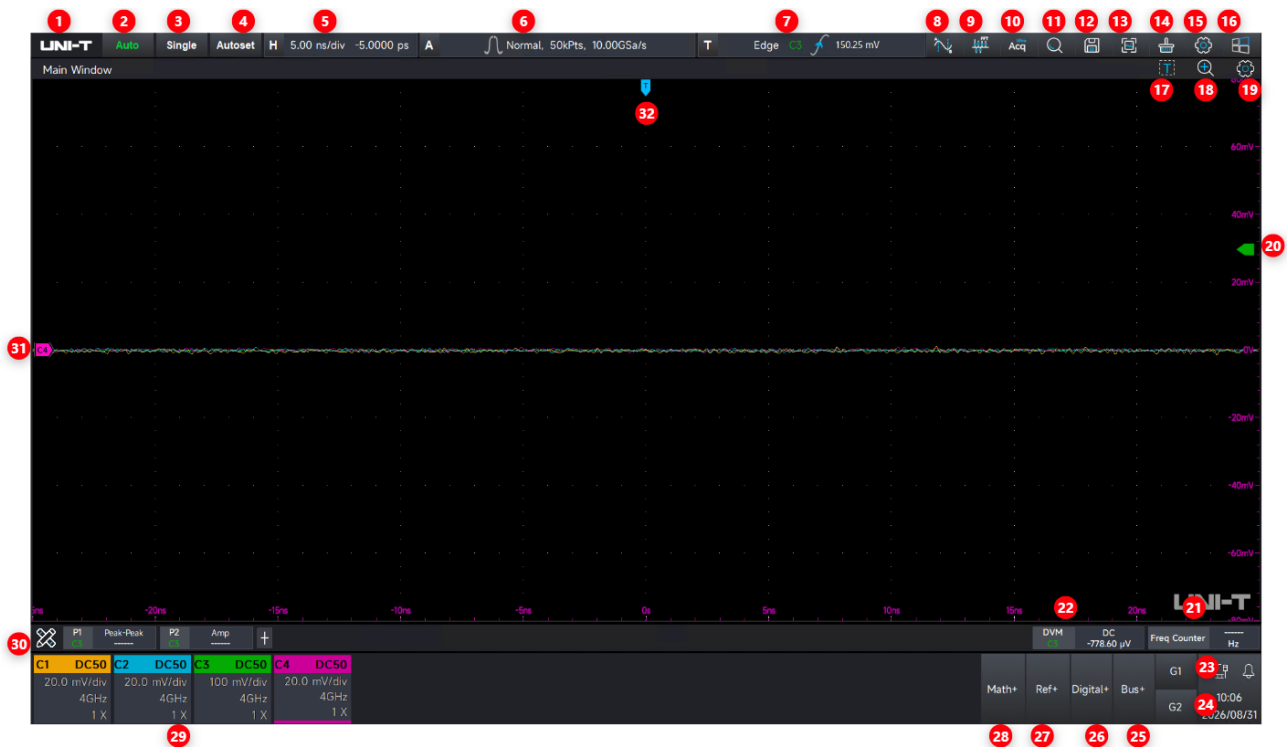


Figure 5 User Interface

Table 3 Icon in User Interface

No.	Description	No.	Description
1	UNI-T logo	17	Zone trigger, histogram, and zoom
2	Trigger status indicator	18	Waveform zoom
3	Single trigger mode	19	Main-window display settings
4	Autoset	20	Trigger level maker
5	Horizontal scale and delay	21	Frequency counter
6	Acquisition mode, memory depth and sample rate	22	Digital voltmeter
7	Trigger information	23/24	Function/Arbitrary waveform generator
8	Cursor measurement	25	Protocol analyzer
9	FFT	26	Logic analyzer
10	UltraAcq® mode	27	Reference waveforms
11	Search and navigation	28	Math waveform
12	Save/Recall	29	Channel status indicator
13	Screenshot	30	Measurement menu

14	Clear waveform	31	Analog channel maker and waveform
15	System setting	32	Trigger position maker
16	Start menu		

Touch Screen

MSO8000HD series features a 15.6-inch capacitive touchscreen with multi-touch and gesture-control capabilities. The touchscreen provides a responsive interface for waveform viewing and instrument operation.

Supported touch gestures include tapping, pinching, and dragging.

Note: The menu displayed on the screen of the oscilloscope can all use the touch control function.

Tap

Use one finger to slightly tap on an icon or a word on the screen as shown in the following figure.

Tap gestures can be used for:

- Tap the menu display on the screen and then to setup.
- Tap the function icon at the top-right of the screen to open the corresponding function.
- Tap the pop-up numeric keypad to set the parameter.
- Tap the virtual keyboard to set the label name and file name.
- Tap a message to open a close button at the top-right of the screen to close the pop-up window.
- Tap another window displayed on the screen, then proceed with the setup.



Figure 6 Tap Gestures

Pinch

Squeeze two fingers together or separate. Pinch gestures can zoom out or zoom in the waveform. To zoom out the waveform, pinch two fingers together and then slide them apart; to zoom in, spread two fingers apart and then pinch them together, as shown in the following figure.

Pinch gestures can be used for:

- Adjust the horizontal time base of waveform by squeezing in the horizontal direction.
- Adjust the vertical scale of waveform by squeezing in the horizontal direction.



Figure 7 Pinch Gestures

Drag

Use one finger to press and drag the selected item to the aimed position as shown in the following figure.

Drag gestures can be used for:

- Drag the waveform to change the waveform position.
- Drag the window to change the window position.
- Drag the cursor to change the cursor position.

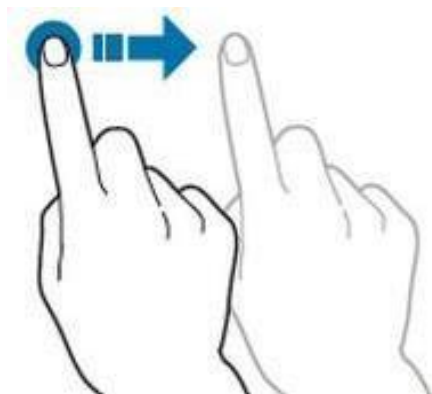


Figure 8 Drag Gestures

Start Menu

Opening the Start Menu:

Tap the Start Menu icon  in the upper-right corner of the screen to open the main menu, as shown in Figure 9.

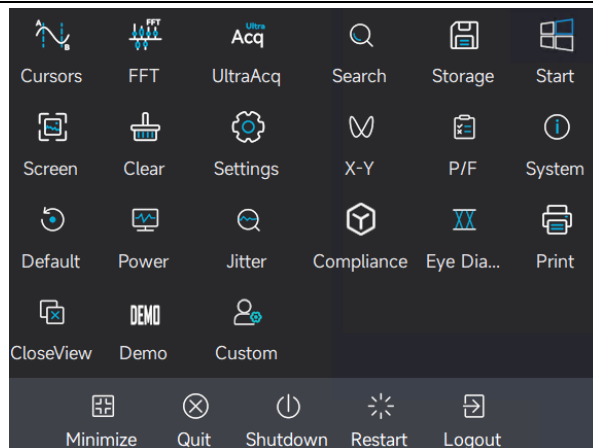


Figure 9 Start Menu

-  **Cursor Measurement:** Opens the cursor measurement function.
-  **FFT:** Opens the FFT function.
-  **UltraAcq:** Activates UltraAcq mode.
-  **Search and Navigation:** Opens the waveform search and navigation functions.
-  **Storage:** Opens the storage function. Settings, waveforms, and screenshots can be saved to the oscilloscope's internal storage or an external USB storage device.
-  **Screenshot:** Captures the entire screen and saves the screenshot to the specified folder. A "Saved successfully" message appears when the operation is complete.
-  **Clear:** Clears historical waveforms and data from the screen.
-  **Utility:** Opens the Utility menu, which includes display settings, Autoset and calibration, communication, auxiliary input/output, and other settings.
-  **Lissajous:** Opens X-Y mode for displaying Lissajous figures.
-  **P/F Test:** Opens the pass/fail test function, including limit testing, standard mask testing, and P/F status display.
-  **System Information:** Opens the instrument system information.
-  **Default Setup:** Restores the instrument to its factory default settings. Tap Confirm to proceed.
-  **Jitter Analysis:** Opens the jitter analysis function.
-  **Eye Diagram:** Opens the eye diagram analysis function.
-  **Compliance:** Opens the compliance analysis function.
-  **Print:** Opens the print settings, where you can print saved images using a connected printer.
-  **Close Subplots:** Closes all subplots, leaving only the main window displayed.
-  **Power Analysis:** Opens the power analysis function.
-  **Custom:** Assigns a function to this shortcut for quick access to functions such as Cursor and Utility.

Measurement Bar

Opening the Measurement Bar:

Tap/click the Measurement Bar icon  in the lower-left corner of the screen to open the Measurement Bar, as shown in Figure 10.

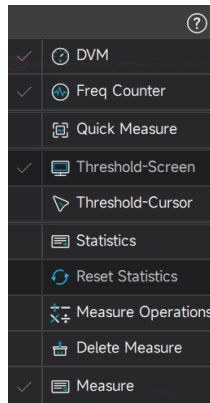


Figure 10 Measurement Bar Menu

-  **DVM** Digital Voltmeter: Opens the digital voltmeter, which supports 4-digit AC RMS, DC, and DC+AC RMS voltage measurements.
-  **Freq Counter** Frequency Counter: Opens the 8-digit high-resolution frequency counter.
-  **Quick Measure** Measurement Snapshot: Opens the measurement snapshot to display multiple measurement parameters simultaneously.
-  **Threshold-Screen** Measurement-Screen: Sets the measurement range to the entire screen.
-  **Threshold-Cursor** Measurement Threshold-Cursor: Sets the measurement range to the area defined by the cursors.
-  **Statistics** Measurement Statistics: Opens measurement statistics, including current, maximum, minimum, mean, standard deviation, and count.
-  **Reset Statistics** Reset Measurement Statistics: Resets the statistics for all added measurements. This function is available when measurement statistics are enabled.
-  **Measure** Measurement: Enables or disables the measurement function.
-  **Measure Operations** Measurement Math: Opens measurement math to perform mathematical operations between measurement parameters.
-  **Delete Measure** Delete All Measurements: Deletes all added measurements.

Communication

The MSO8000HD Series mixed signal oscilloscopes support communication with a computer via USB and LAN for remote control. Remote control is implemented using the SCPI (Standard Commands for Programmable Instruments) command set.

The MSO8000HD Series supports the following three communication methods:

1. LAN: SCPI communication.
2. USB: SCPI communication.
3. WebServer: Browser-based SCPI communication, remote desktop access, data export, and other functions.

Tap the Utility Settings icon , and then select Communication from the menu.

Network

Before using the LAN interface, connect the oscilloscope to your local area network (LAN) using an Ethernet cable. The LAN port is located on the rear panel of the instrument.

Open the network settings interface, as shown in Figure 11, to view the current network settings and configure the network parameters.

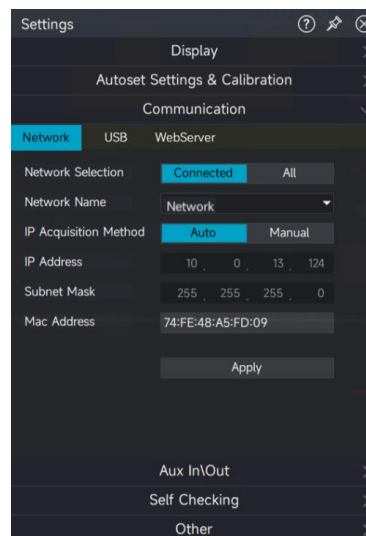


Figure 11 Network Parameter Configuration

USB

The USB interface displays information such as the Vendor ID, Product ID, serial number, and current VISA resource address, as shown in Figure 12.

The oscilloscope can communicate directly with a PC through the USB Device port on the rear panel. No additional parameter configuration is required.

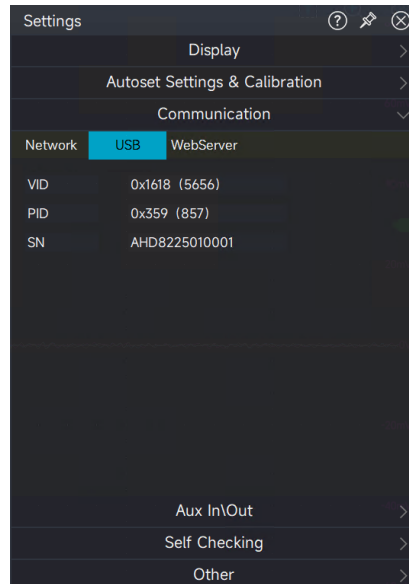


Figure 12 USB

WebServer

The Web Server displays the current network status.

Default network port: 80

Access from a PC

The PC and oscilloscope must be connected to the same local area network and be able to communicate with each other through ping.

You can view the oscilloscope local IP address through the Utility menu or by tapping the Settings icon  on the oscilloscope.

Enter the IP address followed by port **80** in a web browser to access the oscilloscope Web Server, as shown in Figure 13.

Example:

PC IP address: 10.0.13.131

Oscilloscope IP address: 10.0.13.124

Gateway: 255.255.255.1

Enter 10.0.13.124:80 in the PC browser to access the oscilloscope.

The Web Server provides access to device information, remote control, SCPI control, waveform export, document export, and other functions.

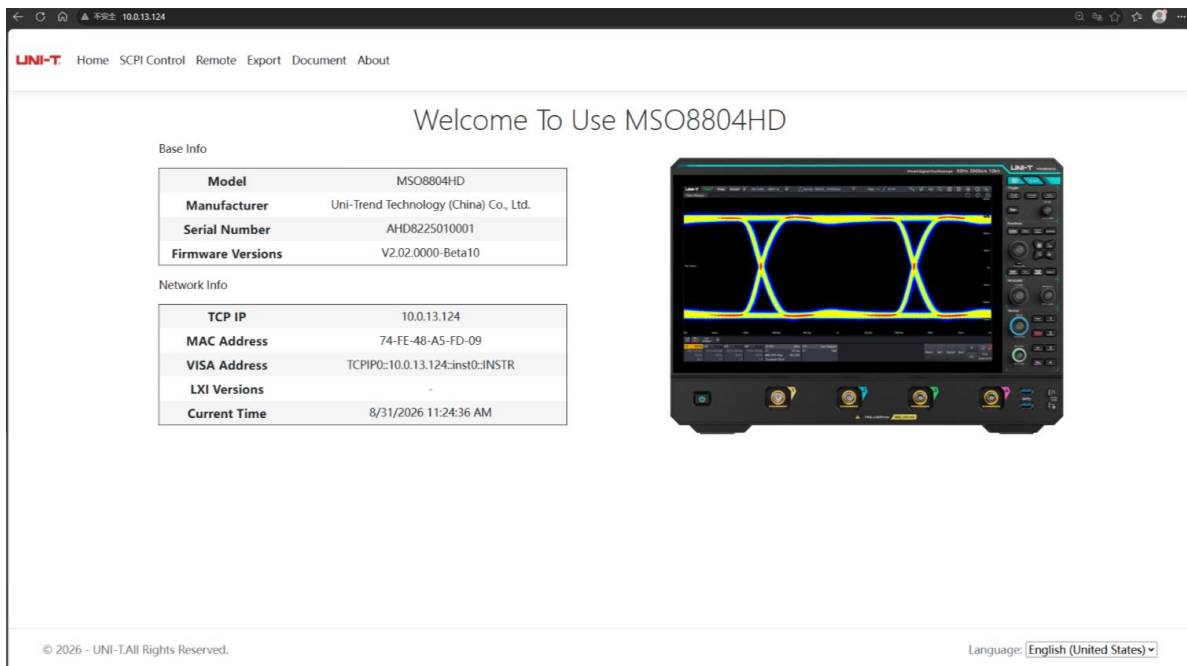


Figure 13 Web Server-Home Page

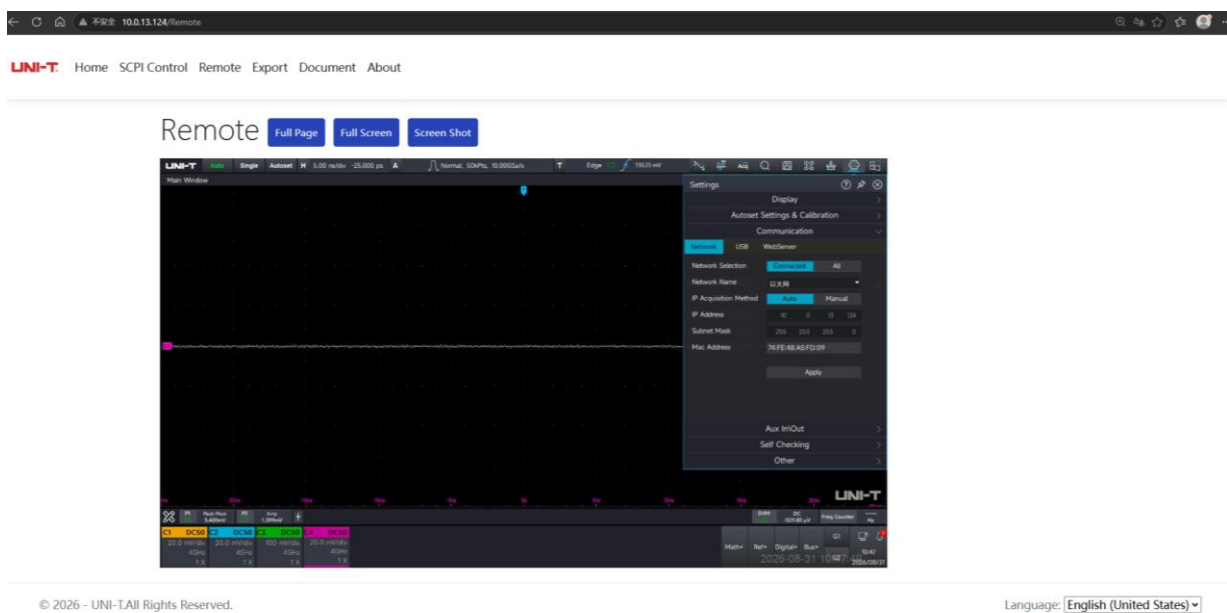


Figure 14 Remote Control

Access from a Mobile Phone

The mobile phone and oscilloscope must be connected to the same local area network (usually the same WLAN).

View the oscilloscope local IP address through the oscilloscope settings menu, then enter the IP address followed by port 80 in a mobile browser to access the Web Server.

The functions available on the mobile phone are the same as those on the PC. The only difference is the interface layout.



Figure 15 Web Server-Home Page

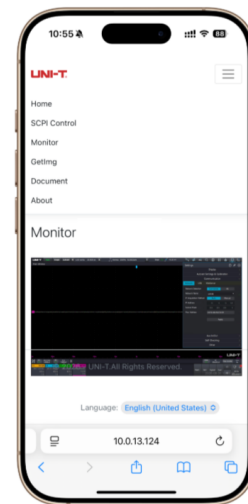


Figure 16 Remote Control

Troubleshooting

This section lists possible problems that may occur during oscilloscope operation and provides troubleshooting methods.

When a problem occurs, follow the corresponding steps to resolve it. If the problem persists, contact UNI-T and provide the instrument information.

(1) The Oscilloscope Screen Remains Blank After Pressing the Power Button

If the oscilloscope still displays a black screen with no information after pressing the power button, perform the following checks:

- ① Check whether the power cord is properly connected and whether the power supply is operating normally.
- ② Check whether the oscilloscope power switch is turned on. After power-on, the power button indicator on the front panel should turn red. After pressing the power button to start the oscilloscope, the indicator should turn blue and the oscilloscope should produce a startup sound.
- ③ If a startup sound is heard, the oscilloscope has started normally.
- ④ If the oscilloscope still cannot operate normally, contact UNI-T for technical support.

(2) No Waveform Is Displayed After Signal Acquisition

If no waveform appears on the screen after signal acquisition, perform the following steps:

- ① Check whether the probe is properly connected to the device under test (DUT).
- ② Check whether the signal cable is properly connected to the analog input channel.
- ③ Check whether the signal input terminal corresponds to the enabled oscilloscope channel.
- ④ Connect the probe tip to the probe compensation output terminal on the front panel to verify whether the probe is functioning properly.
- ⑤ Check whether the DUT generates a signal. You can connect the signal source channel to the problematic channel to determine the cause of the problem.
- ⑥ Press the **Autoset** key to automatically configure the oscilloscope and reacquire the signal.

(3) The Measured Voltage Amplitude Is 10 Times Larger or Smaller Than the Actual Value

Check whether the channel probe attenuation setting matches the attenuation ratio of the connected probe.

(4) The Displayed Waveform Is Unstable

- ① Check whether the trigger source in the Trigger menu matches the channel receiving the actual input signal.
- ② Check the trigger type. General signals should use Edge Trigger.
- ③ Try changing the trigger coupling setting to High Frequency Reject or Low Frequency Reject to filter out unwanted high-frequency or low-frequency trigger interference.

(5) The Touch Function Does Not Work

- ① Check whether the touchscreen function is enabled. If the touchscreen function is disabled, press the front-panel **Touch Lock** key to enable the touchscreen function.
 - ② Check whether the oscilloscope is near a strong magnetic field. If it is, move the oscilloscope away from the magnetic field source to eliminate interference.
 - ③ Check whether there is oil or dirt on the screen or fingers. If so, clean the screen and fingers.
 - ④ If the touchscreen still cannot operate normally, contact UNI-T for technical support.
- (6) The Waveform Refresh Rate Is Very Slow
- ① Check whether the acquisition mode is set to Average and whether the number of averages is large.
 - ② To increase the waveform update rate, reduce the number of averages or select another acquisition mode.

Maintenance and Cleaning

(1) General Maintenance

Keep the instrument away from direct sunlight.

Caution: Keep sprays, liquids, and solvents away from the instrument and probes to prevent damage.

(2) Cleaning

Inspect the instrument and probes regularly according to the operating environment.

Follow these steps to clean the external surfaces of the instrument:

- a. Use a soft cloth to remove dust from the exterior of the instrument.
- b. When cleaning the LCD screen, take care to protect the transparent LCD panel.
- c. To clean the dust filter, use a screwdriver to remove the screws on the dust cover, and then remove the dust filter. After cleaning, reinstall the dust filter in the reverse order of removal.
- d. Disconnect the power supply before cleaning. Wipe the instrument with a soft cloth slightly dampened with water. Do not use abrasive cleaners or chemical cleaning agents on the instrument or probes.

Warning: Ensure that the instrument is completely dry before use to prevent electrical short circuits or personal injury caused by moisture.