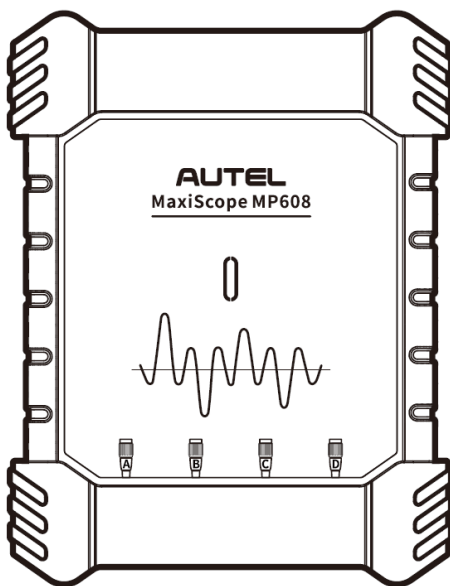


Autel MaxiScope MP608

PC Version



Patent

This product is protected by patents in the U.S. and elsewhere. For more information, please visit <https://autel.us/virtual-patents/>.

Trademarks

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All information, specifications, and illustrations in this manual are based on the latest information available at the time of printing.

Autel reserves the right to make changes at any time without notice. While the information of this manual has been carefully checked for accuracy, no guarantee is given for the completeness and correctness of the contents, including but not limited to the product specifications, functions, and illustrations.

Autel will not be liable for any direct, special, incidental, or indirect damages, or for any economic consequential damages (including the loss of profits) as a result of using this product.

IMPORTANT

Before operating or maintaining this unit, please read this manual carefully, paying extra attention to the safety warnings and precautions.

For Services and Support



pro.autel.com

www.autel.com



1-855-288-3587 (North America)
+86 (0755) 8614-7779 (China)



support@autel.com

For technical assistance in all other markets, please refer to [Service](#) in this manual.

Safety Information

For your own safety and the safety of others, and to prevent damage to the device and vehicles upon which it is used, it is important that the safety instructions presented throughout this manual be read and understood by all persons operating or coming into contact with the device.

There are various procedures, techniques, tools, and parts required for servicing vehicles, as well as the skills of the person doing the work. Because of the vast number of test applications and variations in the products that can be tested with this equipment, we cannot possibly anticipate or provide advice or safety messages to cover every circumstance. It is the automotive technician's responsibility to be knowledgeable of the system being tested. It is crucial to use proper service methods and test procedures. It is essential to perform tests in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, the device being used, or the vehicle being tested.

Before using the device, always refer to and follow the safety messages and applicable test procedures provided by the manufacturer of the vehicle or equipment being tested. Use the device only as described in this manual. Be sure to read, understand, and follow all safety messages and instructions in this manual.

Safety Messages

Safety messages are provided to help prevent personal injury and equipment damage. All safety messages are introduced by a signal word indicating the hazard level.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

Safety Instructions

The safety messages herein cover situations Autel is aware of at the time of publication. Autel cannot know, evaluate or advise you as to all of the possible hazards. You must be certain that any condition or service procedure encountered does not jeopardize your personal safety.

Follow the instructions below to reduce the risk of injury from electric shock and prevent equipment damage.

A. Maximum input ranges

Observe all terminal ratings and warnings marked on the product.

DANGER

- To prevent electric shock, take all necessary safety precautions when working on equipment where voltages beyond the specified input range may exist. Contact with voltages outside of the specified measuring range presents a risk of electric shock.

WARNING

Operation outside of the safe input range is likely to cause permanent damage to the oscilloscope and other connected equipment.

B. Grounding

DANGER

- The scope's ground connection through the USB cable is for measurement purposes only. The oscilloscope does not have a protective safety ground.
- Do not connect the ground input (chassis) to any electrical power source. To prevent personal injury or death, use a voltmeter to check that there is no significant AC or DC voltage between the oscilloscope ground and the point to which you intend to connect the ground input.

WARNING

- Applying a voltage to the ground input is likely to cause permanent damage to the oscilloscope, the attached computer, and other equipment.
 - To prevent measurement errors caused by poor grounding, always use the high-quality USB cable supplied with the oscilloscope.
-

C. External connections

DANGER

To prevent injury or death, use only the power cord and adaptor supplied with the product.

D. Environment

DANGER

To prevent injury or death, do not use the product in wet or damp conditions, or around explosive gas or vapor.

 WARNING

To prevent any damage, always use and store your oscilloscope in an appropriate environment.

E. Product Maintenance

The product contains no user-repairable parts. Repair, servicing, and calibration require specialized test equipment and must be performed by Autel Tech Support or an approved service provider.

 DANGER

To prevent injury or death, do not use the product if it appears to be damaged in any way. Stop using the product when any abnormal operations occur.

 WARNING

- Do not tamper with or disassemble the oscilloscope, connectors, or accessories. Internal damage will affect performance.
 - Do not block any of the instrument's air vents to avoid damage caused by overheating.
 - When cleaning the oscilloscope, use a wet soft cloth with mild detergent in water. Do not allow water to enter the oscilloscope casing.
-

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1 Using this Manual

This manual contains device usage instructions.

Some illustrations shown in this manual may make reference to modules and optional equipment that are not included in your system. Contact your sales representative for availability of other modules and optional tools or accessories.

1.1 Conventions

The following conventions are used:

1.1.1 Bold Text

Bold text is used to highlight selectable items such as buttons and menu options.

Example:

- Click **OK**.

1.1.2 Notes and Important Messages

1.1.2.1 Notes

A **NOTE** provides helpful information such as additional explanations, tips, and comments.

1.1.2.2 Important

IMPORTANT indicates a situation which, if not avoided, may result in damage to the test equipment or vehicle.

1.1.3 Hyperlinks

Hyperlinks are available in electronic documents. Blue italic text indicates a selectable hyperlink; blue underlined text indicates a website link or an email address link.

1.1.4 Illustrations

Illustrations used in this manual are samples; the actual testing screen may vary for each vehicle being tested. Observe the menu titles and on-screen instructions to make correct option selection.

1.1.5 Procedures

An arrow icon indicates a procedure.

Example:

➤ To update the oscilloscope software

1. Click the **System Menu** button in the top menu bar.
2. Click **Update Autel MaxiScope** in the drop-down list to check updates.

2 General Introduction

The Autel MaxiScope MP608 (hereinafter referred to as “MP608”) is a portable, USB-powered, 4-channel automotive oscilloscope that transforms your Windows PC into a professional diagnostic tool. With 12-bit vertical resolution, one-click setup, and support for modern protocols like CAN FD/FlexRay, the Autel MaxiScope MP608 delivers precise waveform analysis from an intuitive interface.

NOTE

The illustrations depicted in this section are only for reference. The actual product may differ.

2.1 Autel MaxiScope MP608

2.1.1 Product Overview

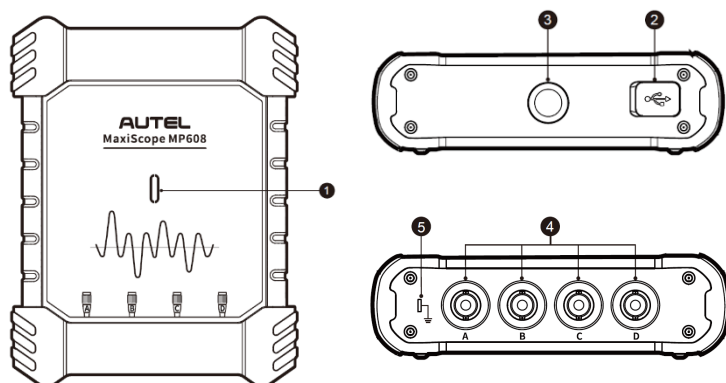


Figure 2-1 Autel MaxiScope MP608

1. Oscilloscope LED — refer to [Table 2-1 Oscilloscope LED Description](#) for details
2. USB Port
3. QD (Quick Detach) Socket
4. Input Channel A/B/C/D
5. Ground Terminal

NOTE

For best signal quality, connect a user-supplied grounding wire to the oscilloscope Ground Terminal when the connected Windows PC or Autel tablet is charging. Grounding is optional when the connected device is operating on battery power.

Table 2-1 Oscilloscope LED Description

LED	Color	Description
Oscilloscope	Red	● Illuminates solid red automatically at power-up during self-test. ● Illuminates solid red if a firmware failure occurs during the upgrade.
	Green	● Flashes green when upgrading or communicating. ● Illuminates solid red first, then solid green when connected to a Windows PC via USB cable.

2.1.2 Power Source

The Autel MaxiScope MP608 is powered directly by the USB port of the connected PC or Autel next-generation MaxiSys tablet, so no batteries or power leads are required, making it suitable for use both for workshop-based and mobile automotive diagnostics.

2.1.3 Technical Specification

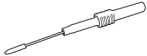
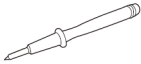
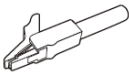
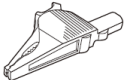
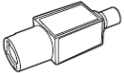
Table 2-2 Technical Specifications

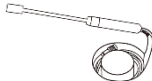
Item	Description
Channels	4
Bandwidth	20MHz
Maximum Sample Rate	● 80 MS/s* Single Channel ● 20 MS/s* Combined Channel * MS/s = mega samples per second
Input Ranges (Full Scale)	± 50 mV to ± 200 V

Item	Description
Sensitivity	10 mV/div to 40 V/div
Input Coupling	AC/DC
Input Impedance	1 MΩ in parallel with 25 pF
Vertical Resolution	12 bits
Buffer Memory	32M samples shared among active channels
Time Base Ranges	100 ns/div to 1000 s/div
Connection	USB 2.0
DC Accuracy	±1%
Storage Humidity Range	5 to 95 % RH, non-condensing

2.1.4 Accessories

	Autel USB Cable V2 (the V2 icon can be seen on the cable) Connects the oscilloscope to the Windows PC to ensure reliable signal transmission.
	Secondary Ignition Pickup The BNC connector is connected to the oscilloscope to measure the secondary ignition voltage of conventional ignition systems and most HEI (High Energy Ignition) and DIS (Distributorless Ignition) systems.

	Scope Test Lead (Red/Green/Blue/Yellow) The BNC connector is connected to the oscilloscope, and the 4mm banana plug is connected to various probes.
	Flexible Back-pinning Probe (Red/Black) Designed for back-probing under the insulation of multi-plug terminals to detect the signal of the test component. The flexible part can be bent and access difficult areas. The probe tip is not replaceable.
	Back-pinning Probe Set Designed for back-probing under the insulation of plugs to pick up the signal of the test component. The probe tip is replaceable.
	Multimeter Probe (Red/Black) Designed for connecting exposed wires or terminals.
	Small Alligator Clips (Red/Black) Used to connect exposed wires or terminals.
	Large Dolphin Clips (Red/Black) Used to connect exposed wires or terminals, including battery terminals.
	Attenuators 20:1 Passive 20:1 attenuator that reduces a 20 V input signal to 1 V at the oscilloscope input, allowing higher-voltage signals to be measured safely.

	Adjustable Strap with Hook Connects to the QD Socket for hanging the oscilloscope.
	Battery Clip (Optional) (Red/Black) Dedicated to connecting car battery terminals.
	65A AC/DC Current Clamp (Optional) Used to measure AC or DC currents up to 65A. Two scales are available: 1mV/10mA for 10mA to 20A, 1mV/100mA for 100mA to 65A.
	650A AC/DC Current Clamp (Optional) Used to measure AC or DC currents up to 650A. Two scales are available: 1mV/100mA for 100mA to 200A, 1mV/1A for 1A to 650A.
	Coil On Plug (COP) Probe (Optional) Used with the oscilloscope to measure the secondary ignition voltage of COP.
	HT Extension Lead (Optional) Fit the HT extension leads between the coil pack and the plugs of the independent ignition system (COP), and then place the (SA273) secondary ignition pickup on each lead to obtain the secondary ignition voltage.

3 Getting Started

The Autel MaxiScope MP608 is an automotive oscilloscope that runs on a Windows-based PC. Make sure to install the Autel MaxiScope PC software before connecting the device for the first time.

3.1 System Requirement

To ensure the Autel MaxiScope software operates correctly, use a computer with at least the minimum system requirements as shown in the table below. A more powerful PC will improve the performance of the Autel MaxiScope software.

Table 3-1 System Requirements

Item	Minimum Specification	Recommended Specification
Operating System	Windows 10 (64-bit) Build 1809 and above or Windows 11 (64-bit)	
Processor	Intel Core i5 2nd Generation (Sandy Bridge) / AMD A Series Dual-Core 1.6 GHz	Intel Core i5 8th Generation / AMD Ryzen 5 Quad-Core 2.5 GHz and above
Memory	4 GB RAM	8 GB RAM and above
Graphics Card	Integrated or discrete graphics card that meets Windows 10 / 11 system requirements	Integrated graphics card (Intel UHD 620 / Iris Xe, etc.) or entry-level discrete graphics card
GPU Driver	Manufacturer-signed driver (not the default Windows WDDM display driver)	The latest driver from the graphics card manufacturer's official website
Display Resolution	1920 × 1080	1920 × 1080 and above
Free Disk Space	2 GB	4 GB and above
Ports	USB 2.0 Port	USB 3.0 / 3.1 / 3.2 Port (Highly recommended for high-speed data acquisition)

3.2 Install Autel MaxiScope Software

The Autel MaxiScope software is a processing program that runs on the computer, which presents as an operating interface displaying waveforms and menus, allowing you to set the testing options, triggers, probe types, and various configurations.

➤ **To install the Setup.exe program**

1. Download the Autel MaxiScope software from www.autel.com > **Supports** > **Downloads** > **Diagnostic Tool** > **Autel MaxiScope**.
2. Unzip the downloaded file and double-click **Setup.exe** to install the software, and then click **Next** to continue.
3. Click the **Browse** button and select a destination folder to install the program, or directly install it in the default installation folder.
4. Click **Install**, and the program will be installed onto the computer. Once the installation is complete, click the **Finish** button.

3.3 Device Connection

Before opening the Autel MaxiScope application, the MP608 must be connected to a compatible Windows PC via the provided USB cable.

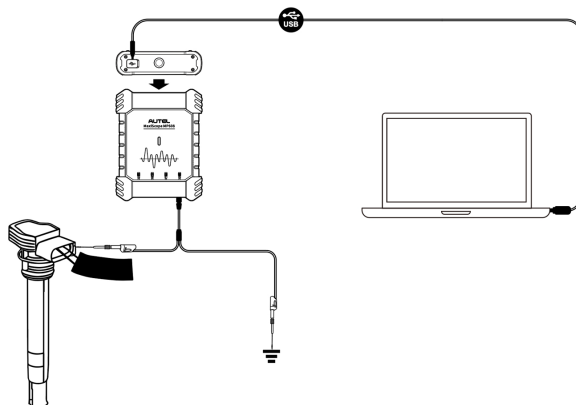


Figure 3-1 Connection Diagram Example

➤ **To open the Autel MaxiScope application**

1. Connect the Autel MaxiScope MP608 to a Windows PC using the USB 2.0 Cable V2.
2. Insert the applicable test lead or probe terminal ends into the input channel(s) to complete the connection. (See [Figure 3-1 Connection Diagram Example](#))

3. Click **Autel MaxiScope** from the Windows Start menu to open the oscilloscope menu.
4. Select a desired testing option to continue.

❗ IMPORTANT

- Please use only the included cords and probes. Using unauthorized accessories may cause unexpected damage to the tool.
- Connect the probe ground lead to the circuit ground before connecting the probe tip to the test point. When disconnecting the probe, remove the probe tip from the test point before disconnecting the ground lead. Incorrect probe connection may cause short circuits, excessive current, damage to the oscilloscope or the vehicle, or personal injury.

3.3.1 Message Prompt

If the MP608 is not connected to a compatible PC, a message that reads "Please select a device from the list below" appears after opening the oscilloscope menu. Select **Demo Mode** and then click **OK** to enter the demo mode or click **Cancel** to exit.

3.4 Oscilloscope Update

The operating software for the oscilloscope is regularly updated.

➤ To update the oscilloscope software

1. Click the **System Menu** button in the top menu bar.
2. Click **Update Autel MaxiScope** in the drop-down list to check updates.

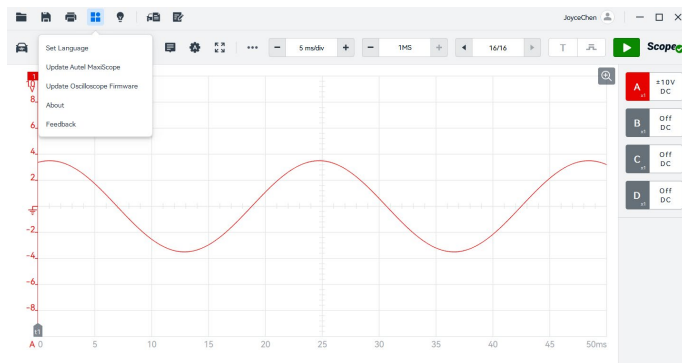


Figure 3-2 Update Autel MaxiScope Screen

4 Operations

The Autel MaxiScope application measures changing voltages in an electrical system over a period of time and displays them as waveforms. The on-screen grid shows voltage and time divisions, enabling accurate measurements.

Select **Autel MaxiScope** from the Windows Start menu. The screen typically includes the following sections.

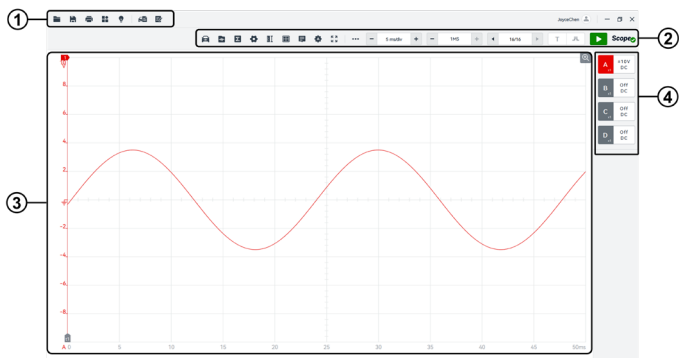


Figure 4-1 Oscilloscope Menu Screen

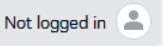
- 1. Menu Bar
- 2. Top Toolbar
- 3. Main Section
- 4. Side Toolbar

4.1 Menu Bar

The menu bar is used to configure various settings and operations. The following table provides brief descriptions of each button.

Table 4-1 Menu Bar Table

Button	Name	Description
	Files	Allows you to create a new work order, open a work order, open waveforms, view recent waveforms, and import configurations.

Button	Name	Description
	Save	Allows you to save configurations, save waveforms, and save files.
	Print	Allows you to print waveforms.
	System Menu	Allows you to adjust the display language, update the Autel MaxiScope software, and update the oscilloscope firmware.
	Help	Allows you to access the user manual.
	Vehicle Details	Allows you to edit the vehicle details, including the VIN, Odometer Reading, Make, Model, Year, Engine, Chassis Number, and other information.
	Notes	Allows you to enter a text note.
	Log In with Autel Cloud	Allows you to log in to or out of the Autel Cloud platform and view account information.

4.1.1 Files

Five options are available in the Files menu.

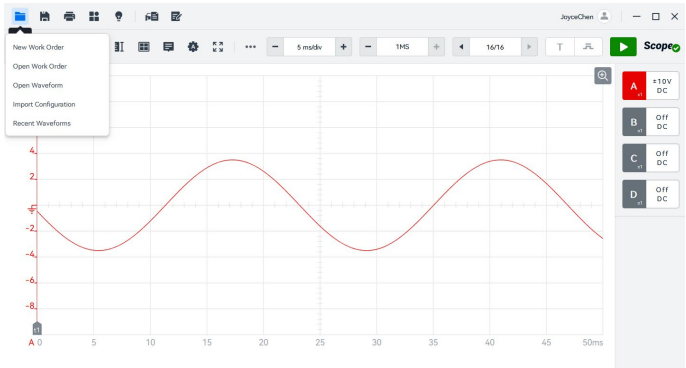


Figure 4-2 File Screen

New Work Order: Creates a new work order for the current vehicle. The created work order appears in the center of the Menu Bar. Click the created work order to view information such as the work order number and vehicle details.

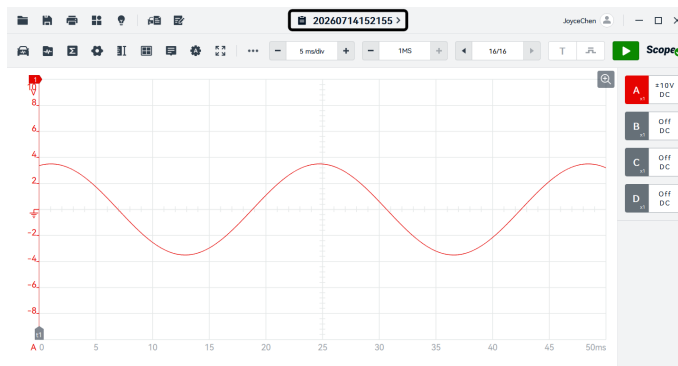


Figure 4-3 The Created Work Order Screen

Open Work Order: Opens an existing work order. Select **Files > Open Work Order > View Details > Select This Order** to open the desired work order.

Open Waveforms: Opens locally saved waveforms. Search by waveform code, VIN, mode, or filter conditions to locate the desired waveform.

Import Configuration: Imports configuration files, including factory default configurations, user-saved default configurations, and configurations from the previous session.

Recent Waveform: Displays the most recently opened waveform.

4.1.2 Save

In this menu, you can save configurations, waveforms, and other files.

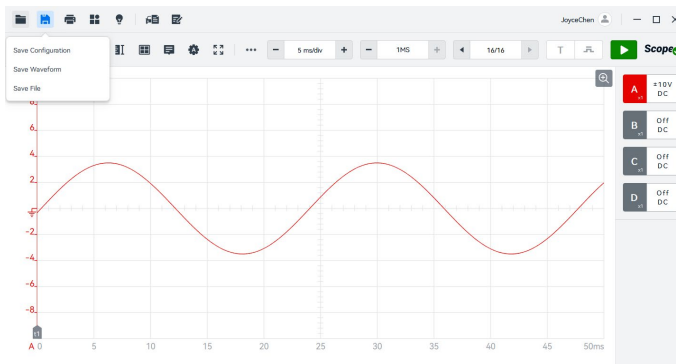


Figure 4-4 Save Screen

Save Configuration: There are two methods for saving configurations based on your needs.

- Click the **Save as Config File** tab to save the current settings with a custom file name.
- Click **Save as User Default Config** to save the current settings as the permanent default profile. Note that this action will overwrite any previously saved user default configuration.

Save Waveform: Save the waveform to a user-specified location or upload the waveform to the Autel platform. The waveform can be saved to a work order once you select the one you created. The vehicle and channel details can be manually modified. Add a note or an attachment on the Save screen if needed.

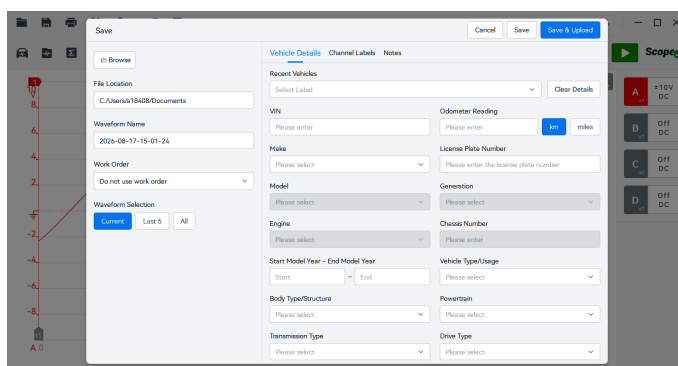


Figure 4-5 Saving Waveform Screen

Save File: Confirm the file location, file name, and file type. Click the **Save** button to save a file to the location you need.

4.1.3 Print

Click the **Print** button on the top menu bar to open the print screen. Configure the print options on the left settings panel, then click the **Print** button at the upper-right corner to output waveforms.

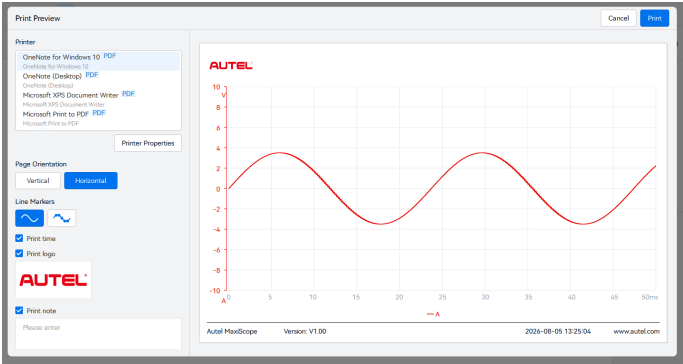


Figure 4-6 Print Screen

4.1.4 System Menu

In this menu, you can set the system language, update the Autel MaxiScope software, update the device firmware, check the oscilloscope software version, and send user feedback to Autel's online service center.

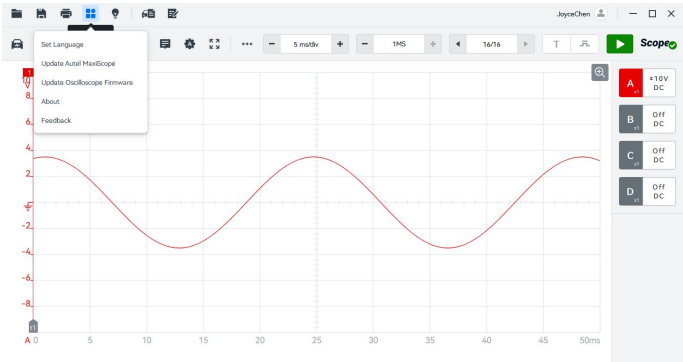


Figure 4-7 System Menu Screen

Set Language: Adjust the display system language.

Update Autel MaxiScope: Check the Autel MaxiScope software version. Update the software if a new version is available.

Update Oscilloscope Firmware: Check the oscilloscope's current firmware version. Click **Update Now** if a new version is available.

 NOTE

Ensure the oscilloscope is connected to a Windows PC before updating its firmware.

About: View information such as the oscilloscope firmware date, firmware version, software version, build information, and the end-user agreement.

Feedback: Select the feedback type and enter the email address to send feedback to Autel's online service center.

4.1.5 Help

Click the **Help** button on the top Menu Bar to access the user manual.

4.1.6 Vehicle Details

The detailed vehicle information, including the VIN, Odometer Reading, Make, Model, Year, Engine, Chassis Number, Powertrain, Body Type, Transmission Type, Drive Type, and other information, can be selected or entered manually.

4.1.7 Notes

Users can enter a text note in the dialog box if needed. Click **OK** to confirm. The added notes can be saved locally or uploaded to the Autel Cloud platform.

4.1.8 Log In with Autel Cloud

 NOTE

Make sure the oscilloscope is connected to the Windows PC. Ensure the Windows PC has a stable network.

The Autel Cloud login entry is located in the upper-right corner of the screen. When the status displays "**Not logged in**", click the Account icon, then click **Log In with Autel Cloud**. Register an Autel account and log in to the Autel Cloud platform, or directly log in if you already have an Autel account. After logging in through the browser, click **Allow** if

an authorization prompt appears in the upper-left corner of the Autel Cloud platform.

Return to the Autel MaxiScope home screen after logging in to the Autel Cloud platform.

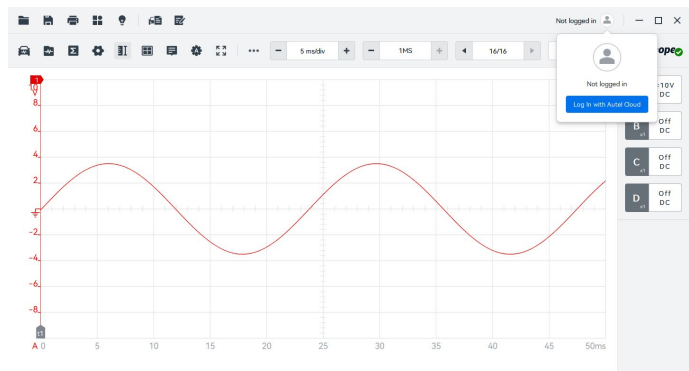


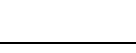
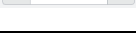
Figure 4-8 Login Entry Screen

4.2 Top Toolbar

The top toolbar is used to configure various settings and operations. The following table provides brief descriptions of each button.

Table 4-2 Top Toolbar Table

Button	Name	Description
	Case Library	Configure the oscilloscope to capture a waveform of the specified type.
	Waveform Library	Search, open, upload, share, and delete waveforms in the waveform library.
	Math Channels	Display the built-in math channel on the screen.
	Settings	Adjust settings such as Mode, Startup, and Demo options.
	Measurement	Select appropriate measurements and configure measurement rulers.
	Multi-window	Configure oscilloscope, spectrum, and XY views simultaneously with a multi-window layout.

Button	Name	Description
	Description	Add descriptions at key points on the waveform.
	Auto Setup	Automatically optimize the oscilloscope's vertical scale, time base, trigger mode, and trigger level to display the input signal.
	Fullscreen	Expand to full screen.
	More	Show more functions, such as Channel Labels, Decoding, Connect Device, and AI Formula Assistant. Click the "+" or "-" button to add more functions or remove the added functions.
	Time Base	Control the oscilloscope data sampling display time.
	Target Sample Count	Set the number of sample points to be captured per waveform record. Higher counts provide more detail at slower time base settings, but consume more memory.
	Waveform Playback	Review previously captured waveform data frame by frame.
	Trigger	Open the trigger settings menu.
	Start/Stop Button	Start or stop the oscilloscope device.
	Scope Icon	Indicates the oscilloscope connection status.

4.2.1 Case Library

This function offers a wide variety of preset guided information for you to view.

NOTE

Log in to the Autel Cloud platform first (see [Log In with Autel Cloud](#)) before using this function.

The frequently used test components and options are listed in the Case Library menu:

- ✧ **Battery Charging** — test the functions related to car charging, including current and voltage idle tests.
- ✧ **Engine Starting** — test the functions related to car starting, including starting current and voltage tests.
- ✧ **Sensors** — test common car sensors such as ABS, oxygen, pressure, speed, and temperature sensors.
- ✧ **Actuators** — test common car actuators such as injectors, secondary air pumps, fuel pumps, and cooling fans.
- ✧ **Combination Test** — combined test of the vehicle's sensors or actuators, such as the primary ignition and crankshaft position sensor, the primary ignition and injector, or the throttle position and motor.
- ✧ **Ignition Systems** — test the ignition process of the vehicle, such as the COP (coil-on-plug) ignition, integrated COP ignition, etc.
- ✧ **Data Communication** — test the vehicle communication buses, including CAN bus, LIN bus, and K-Line.
- **To use the Case Library menu**

1. Click the **Case Library** button in the top toolbar, then select a desired case type.

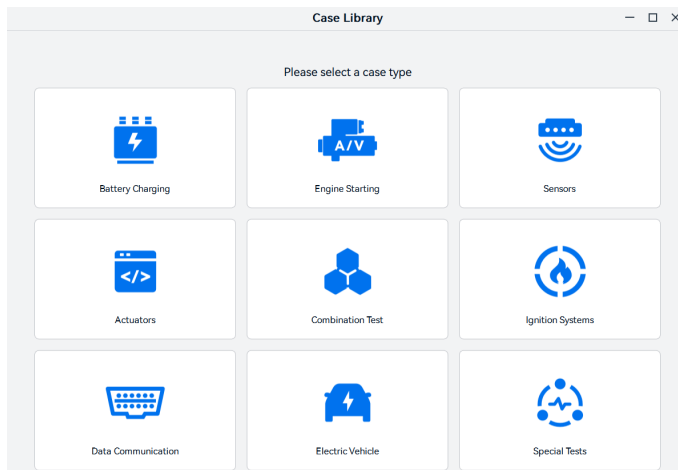


Figure 4-9 Case Library Screen 1

2. Choose an option you need from the submenu. If there is no preset case or the current version of the case is too low, click the **Download** icon () to download a new case. If the current case is already a new version, the download button will not be displayed.

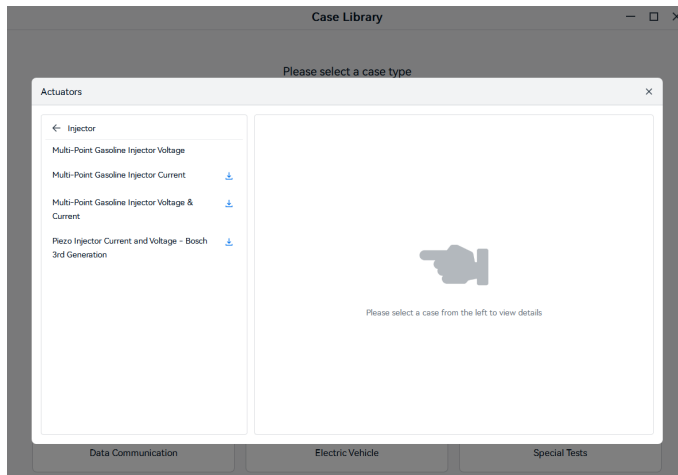


Figure 4-10 Case Library Screen 2

3. The preset guided information, including the general description, connection guide, test guide, example waveform, waveform analysis, and related fault codes, is shown on the screen. Scroll up and down with the mouse wheel to read the whole contents, or click the  button and select the contents you want to read. The preset example waveform can be opened or uploaded as a reference waveform by clicking **Open Waveform** or **Load Reference Waveform**.

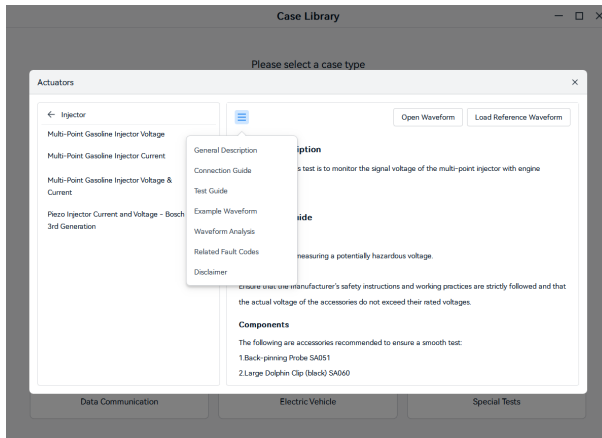


Figure 4-11 Case Library Screen 3

4.2.2 Waveform Library

The waveform library includes a local waveform library and an online waveform library. This manual covers the local waveform library. For information related to the online waveform library, please refer to the Autel Cloud platform.

Enter the waveform code, VIN, vehicle model, or filter conditions, and then click the **Search** button to search the waveforms saved in the local library. The results include the waveform picture, waveform ID, test conditions, etc.

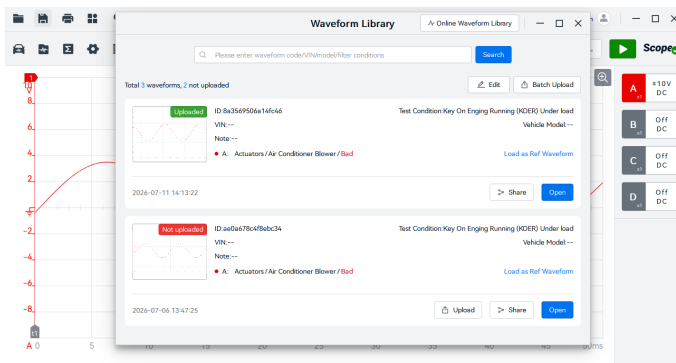


Figure 4-12 Waveform Library Screen

Edit: Select and delete the waveform(s).

Batch Upload: Select and batch upload the waveforms to the Autel Cloud platform.

Load as Ref Waveform: Load as a reference waveform.

Upload: Upload a waveform to the Autel Cloud platform.

Share: Upload the waveform first and then share it with Autel Cloud users via QR code, Email, or SMS. Remember to use an Autel diagnostic device to scan the QR code to obtain the waveform data.

Open: Open the selected waveform. The configurations, such as the thumbnail size, capture time, capture event, and maximum waveform, can be manually adjusted at the waveform navigator on the right side of the screen.

4.2.3 Math Channels

A math channel is a virtual channel generated by applying a mathematical function to one or more input channels. It performs some basic calculations on the captured data.

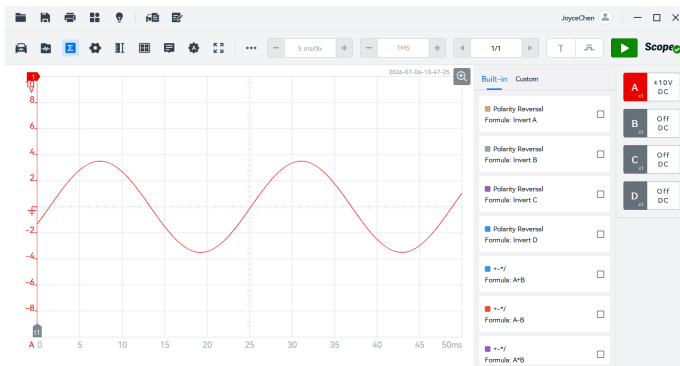


Figure 4-13 Math Channel Screen

The oscilloscope has a set of built-in math channels:

- ✧ **Invert A:** invert channel A
- ✧ **Invert B:** invert channel B
- ✧ **Invert C:** invert channel C
- ✧ **Invert D:** invert channel D
- ✧ **A+B:** channel A plus channel B
- ✧ **A-B:** channel A minus channel B
- ✧ **A*B:** multiply channel A by channel B
- ✧ **A/B:** channel A divided by channel B
- ✧ **F-A:** the frequency of channel A

- ✧ **F-B**: the frequency of channel B
- ✧ **F-C**: the frequency of channel C
- ✧ **F-D**: the frequency of channel D
- **To set the math channel**

Using **Invert A** as an example.

1. Click **Math Channel** on the top toolbar.
2. Select **Invert A** on the right side of the screen.
3. The waveforms are displayed on the screen.

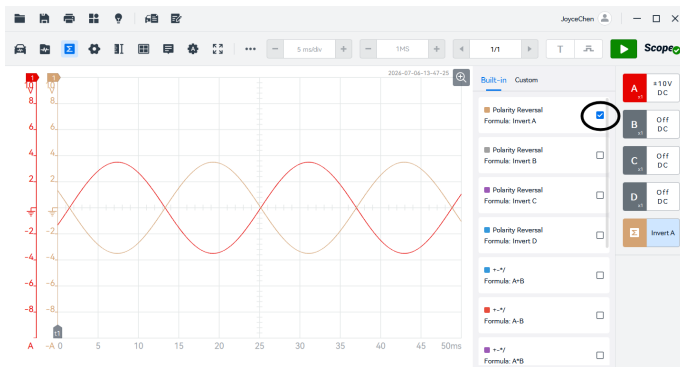


Figure 4-14 Math Channel Settings

Custom math channels are also supported. Click the **Custom** tab and click the **+** Add button to create a math channel.

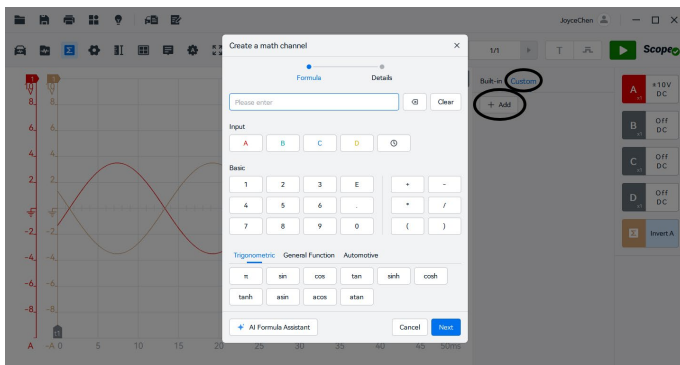


Figure 4-15 Math Channel Settings

4.2.4 Settings

Click the gear icon in the top toolbar to open the **Settings** menu. The **Mode Settings**, **Startup Settings**, **Demo Settings**, and **Reset Configuration** can be manually configured in the menu.

4.2.4.1 Mode Settings

Four views are available: oscilloscope view, XY view, spectrum view, and recorder view.

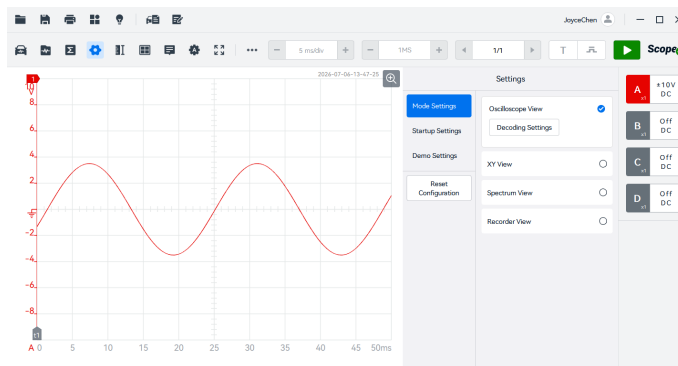


Figure 4-16 Mode Settings Screen

- ✓ **Oscilloscope View:** The waveform shows how a signal varies with time in a graphical way. It is used to analyze signal changes, such as variations in voltage, frequency, amplitude, and waveform stability.

When the oscilloscope view is selected, the decoding settings are available. Click **Decoding Settings** to open a dialog box, then select a required protocol from the dropdown list and click **OK**.

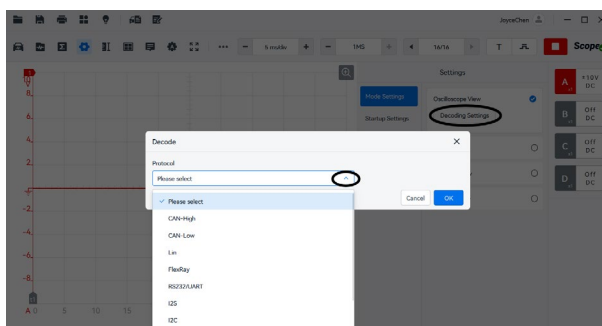


Figure 4-17 Decoding Settings Screen

 NOTE

Protocol decoding is supported under the specified conditions. When multiple channels are enabled, insufficient sampling rate may result in decoding failure or unreliable decoding.

9 protocols are available: CAN High, CAN Low, LIN, FlexRay, RS232/UART, I2S, I2C, USB (1.0/1.1), and CAN FD.

- **CAN High/CAN Low:** CAN (Controller Area Network) is a differential serial communication protocol widely used in automotive electronic systems. It enables reliable communication between electronic control units (ECUs) in noisy electrical environments.
 - **LIN:** LIN (Local Interconnect Network) is a low-speed serial communication protocol used in automotive electronics for communication between an ECU and low-speed devices such as sensors, actuators, etc.
 - **FlexRay:** It is a high-speed automotive communication protocol designed for safety-critical applications that require deterministic and reliable data transmission.
 - **RS232/UART:** RS232/UART (Universal Asynchronous Receiver/Transmitter) is a serial communication protocol commonly used for communication between computers, embedded systems, and electronic devices.
 - **I2S:** I2S (Inter-IC Sound) is a serial communication protocol designed for transmitting digital audio data between audio devices and integrated circuits.
 - **I2C:** I2C (Inter-Integrated Circuit) is a two-wire serial communication protocol widely used for communication between microcontrollers and peripheral devices in embedded and consumer electronic systems.
 - **USB (1.0/1.1):** USB (Universal Serial Bus) is a widely used serial communication protocol for data transfer between computers and peripheral devices.
 - **CAN FD:** CAN FD (CAN with Flexible Data-Rate) is an enhanced version of the CAN communication protocol that supports larger data payloads and faster data transmission while maintaining compatibility with existing CAN networks.
- ✓ **XY View:** The waveform shows the relationships between periodic signals, displaying a graph of one channel against another. It is commonly used to analyze the relationship, phase difference, and synchronization between two signals.

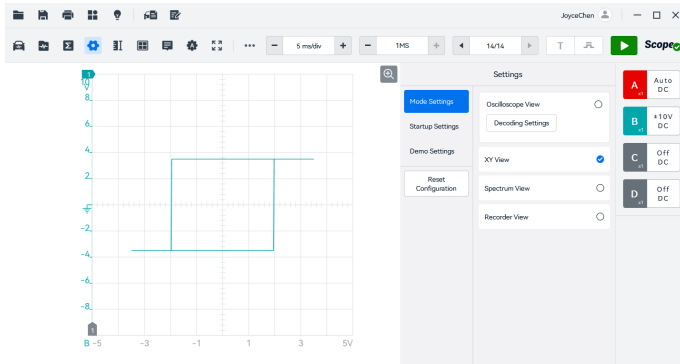


Figure 4-18 XY View Screen

- ✓ **Spectrum View:** The waveform shows the signal level on a vertical axis against frequency on the horizontal axis in a graphical way. It converts time-domain signals into frequency-domain data for analysis of frequency distribution, harmonics, noise, and interference. One or more spectra with a common frequency axis can be displayed in the spectrum view.

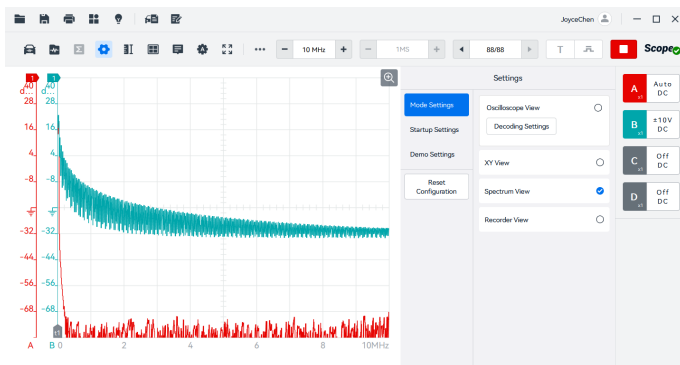


Figure 4-19 Spectrum View Screen

- ✓ **Recorder View:** The waveform records the signal and shows the signal record. It allows you to view and analyze long-duration waveform recordings.

4.2.4.2 Startup Settings

This function allows the user to choose the startup configurations when launching the oscilloscope application.

The Startup Settings screen provides three options for selecting the configuration to be loaded when the oscilloscope starts up. Select one option according to the specific need.

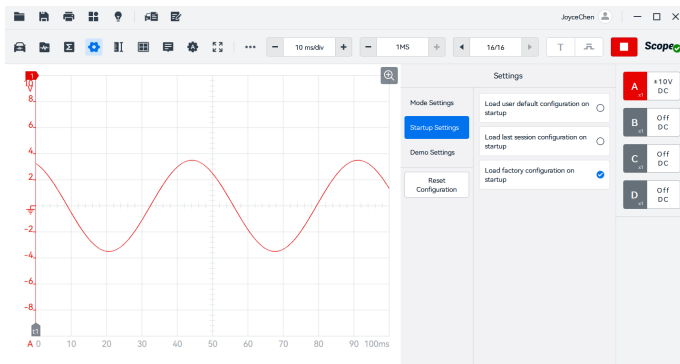


Figure 4-20 Startup Settings Screen

Load user default configuration on startup: Loads the configuration saved by the user as the default configuration when the oscilloscope starts up.

Load last session configuration on startup: Loads the configuration used in the previous session when the oscilloscope starts up.

Load factory configuration on startup: Loads the factory default configuration when the oscilloscope starts up.

4.2.4.3 Demo Settings

Configure the input channel and simulated waveform for Demo mode. By default, Channel A is selected, and the waveform is set to Sine Wave.

➤ To configure demo settings

1. Click **Settings** on the top toolbar.
2. Click the left side of the desired channel on the Side Toolbar to activate it. Select a simulated waveform type in the drop-down list.

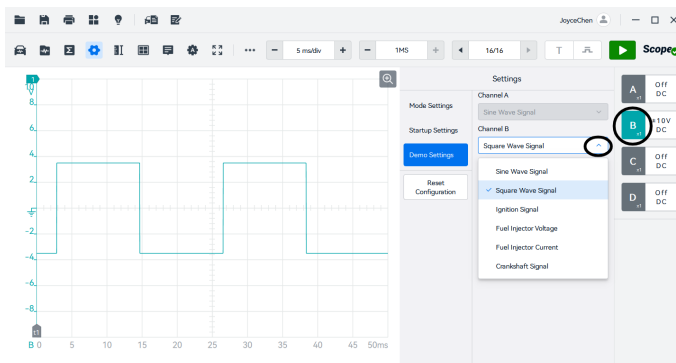


Figure 4-21 Demo Settings Screen 2

3. Adjust the waveform rate by clicking "+" or "-". Alternatively, click the rate value to open the settings dialog, then enter the desired value or drag the slider to adjust the rate.

4.2.4.4 Reset Configuration

Click this option to restore the default oscilloscope configurations. A prompt will appear to confirm the operation when clicking this option. Click **OK** to continue or click **Cancel** to exit.

4.2.5 Measurement

Click **Measurement** on the top toolbar and then select the **Measurement**, **Advanced Measure**, or **Ruler** tab based on your needs.

4.2.5.1 Measurement

The Measurement function provides six built-in measurements. Each channel can be configured with multiple measurements simultaneously. Additional measurements can be added if required.

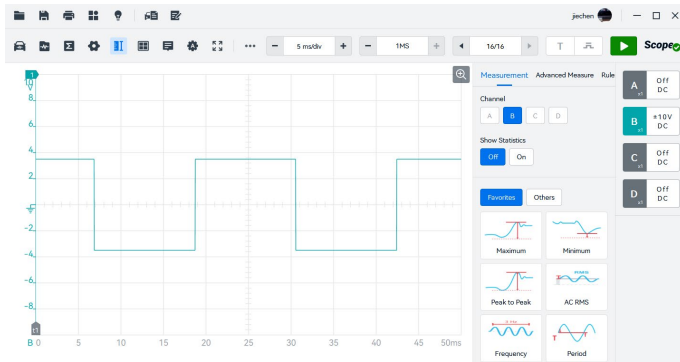


Figure 4-22 Measurement Screen

- ✧ **Maximum** — Measures the highest level that the signal reaches
- ✧ **Minimum** — Measures the lowest level that the signal reaches
- ✧ **Peak To Peak** — Measures the difference between maximum and minimum
- ✧ **AC RMS** — Measures the root mean square (RMS) value of the waveform minus the DC Average
- ✧ **Frequency** — Measures the number of signal occurrences per second
- ✧ **Period** — Measures the duration of one cycle in a repeated pattern in the waveform
- **To set the measurement**
 1. Click **Measurement** on the top toolbar.
 2. Click the **Measurement** tab.
 3. Select the desired channel to be measured. If you want to open or close the default channel, click the left side of an input channel on the Side Toolbar.
 4. Click the **On/OFF** button to enable/disable **Show Statistics**.
 5. Click the **Favorites** tab and select one or more measurements based on your requirements. The selected measurements are displayed at the bottom of the screen.

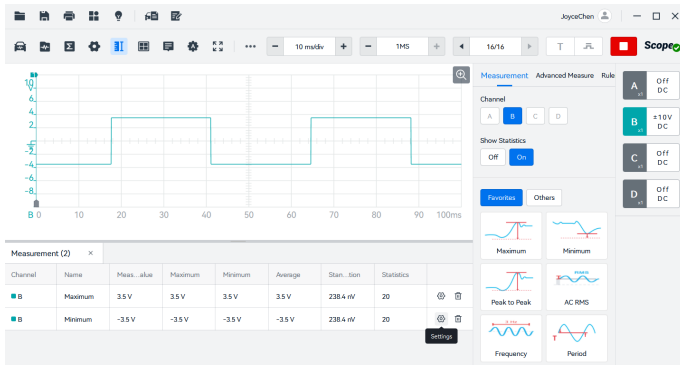


Figure 4-23 Measurement Settings Screen

6. Alternatively, click the **Others** tab and click “+” to add additional measurement(s) to the Favorites tab.

NOTE

When **Show Statistics** is enabled, click the **Settings** icon at the bottom of the screen to configure settings, such as the measurement range, upper limit, and lower limit.

4.2.5.2 Advanced Measure

Advanced Measure provides configurable edge-based measurements for waveform analysis. It allows you to customize parameters such as the measurement channel, threshold, hysteresis, edge type, and rise/fall time threshold to obtain more accurate measurement results.

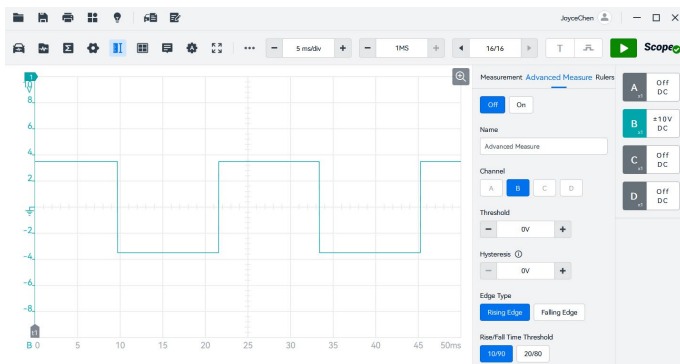


Figure 4-24 Advanced Measure Settings Screen

Off/On: Enables or disables Advanced Measure.

Name: Displays the measurement name.

Channel: Selects the input channel for measurement. The selected channel is the one that the oscilloscope monitors for the test condition.

Threshold: Sets the voltage level used to determine when an edge is detected.

Hysteresis: Sets a voltage tolerance around the threshold to reduce false edge detection caused by signal noise. Setting the hysteresis value can improve edge detection stability.

Edge Type: Selects whether measurements are based on the rising edge or falling edge of the waveform. The Rising Edge or Falling Edge option can be selected.

- **Rising Edge:** Measures waveform parameters based on the transition from a low voltage level to a high voltage level.
- **Falling Edge:** Measures waveform parameters based on the transition from a high voltage level to a low voltage level.

Rise/Fall Time Threshold: Defines the percentage thresholds for the rise/fall time calculation.

Between Time Rulers: Measures waveform parameters only within the area defined by the two time rulers.

➤ **To configure Advanced Measure**

1. Click **Measurement** on the top toolbar.
2. Click the **Advanced Measure** tab.
3. Turn **On** Advanced Measure.
4. Select the desired channel to be configured. If you want to open or close the default channel, click the left side of an input channel on the Side Toolbar.
5. Configure the **Threshold** and **Hysteresis** values by clicking "+" or "-". Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider to adjust the value. The unit can be switched in the settings dialog.
6. Select the appropriate **Edge Type**.
7. Configure the **Rise/Fall Time Threshold** if required.
8. Enable **Between Time Rulers** if measurements between rulers are needed.

4.2.5.3 *Rulers*

The Ruler function provides on-screen rulers for precise waveform measurements. It is useful when determining signal characteristics such as amplitude at specific points, the cycle time (duration), frequency, and phase difference.

There are three types of measurement rulers:

Time Ruler: Displays time rulers for measuring the time interval between two points on a waveform.

Channel Ruler: Select the input channel on which the ruler is placed.

Phase Ruler: Provides phase-based cursor measurements for comparing waveform positions within a signal cycle.

Lower/Upper: Defines the start and end positions of the ruler range.

Partitions: Used to divide the ruler range into equal sections for easier waveform analysis.

Locate the **Ruler Activator** in the lower-left or upper-left corner of the grid. When the mouse cursor changes to a vertical or horizontal double-headed arrow, drag the arrow up/down or left/right to generate a ruler.

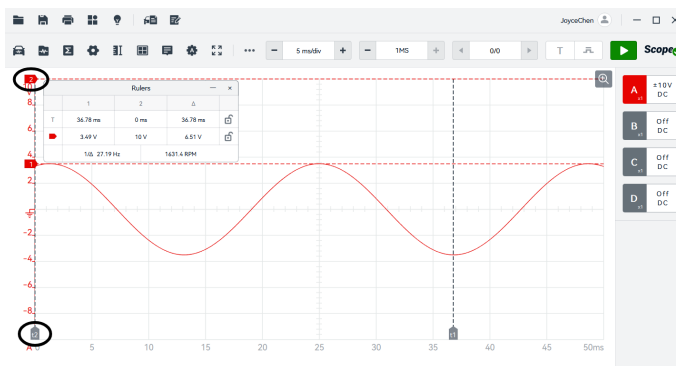


Figure 4-25 Rulers Screen

When dragging the measurement rulers, a **Ruler Table** showing time and voltage values will be displayed. The **Delta** icon refers to the absolute difference between the values of rulers, which can be locked by clicking the **Lock** icon. Click the **X** button in the upper-right corner of the ruler table to delete all rulers.

➤ **To configure Rulers**

1. Click **Measurement** on the top toolbar.
2. Click the **Rulers** tab.

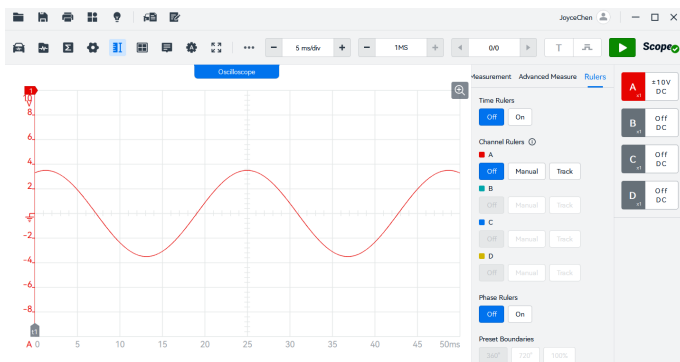


Figure 4-26 Ruler Settings Screen

3. Click **On/Off** to enable or disable the Time Rulers.
4. Configure the **Channel Rulers** for the input channel.
Manual: Manually positions the ruler.
Track: Automatically positions the ruler.
5. Click **On/Off** to enable or disable the Phase Rulers.
6. Quickly set the ruler boundaries to predefined values by selecting **360°**, **720°**, **100%**, or **Custom** (user-defined).
7. If Custom is selected in the preset boundary, click the "+" or "-" button to adjust the lower/upper value. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider. Configure the measurement unit if Custom is selected.
8. Click the "+" or "-" button to adjust the partition value. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider.
9. Click **On/Off** to enable or disable the Wrap function.

4.2.6 Multi-window

This function provides a multi-window layout for displaying oscilloscope, spectrum, and XY views simultaneously, enabling more comprehensive signal analysis. It allows you to add and manage views, and configure each view.

NOTE

The Recorder View is not supported in the multi-window function.

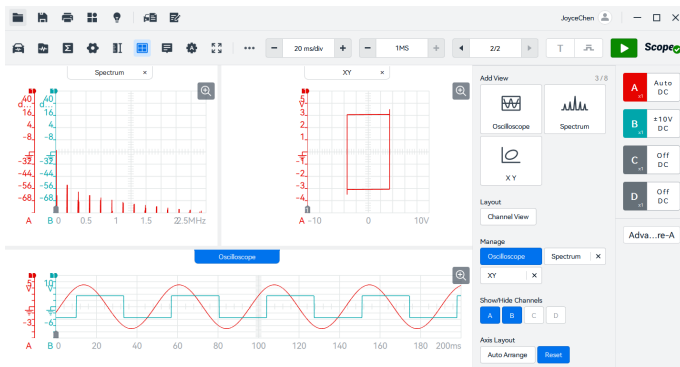


Figure 4-27 Multi-window Settings Screen

Add view: Add one or more Oscilloscope, Spectrum, or XY views. Up to eight views can be displayed simultaneously.

NOTE

When a new view is added, all currently enabled input channels are displayed in the new view by default. If you only need to display specific channels, manually open or hide channel(s) in the selected view.

Layout: The Channel View layout displays the time-domain waveform of the selected input channel. Multiple channel views can be added to the layout to monitor different channels simultaneously.

Manage: Select an added view to configure its settings. Depending on the view type, you can show or hide input channels, select the drawing mode, or assign an input channel to the X-axis.

Show/Hide Channels: Show or hide the enabled input channels in the selected view.

Axis Layout: Auto Arrange automatically aligns the axes in the current layout for a cleaner and more organized display. Reset restores the default axis arrangement for the selected view.

➤ **To configure a multi-window layout**

1. Click **Multi-window** on the top toolbar.
2. Select and add the desired views. Up to 8 views can be added.
3. Click an added view to select it. Configure the **Show/Hide Channels** for each selected view if required.
4. Click the **Reset** button to restore the default axis layout for the current view if needed.

4.2.7 Description

Add descriptions at key points on the waveform. Descriptions help you understand previous measurements when you review the waveform later.

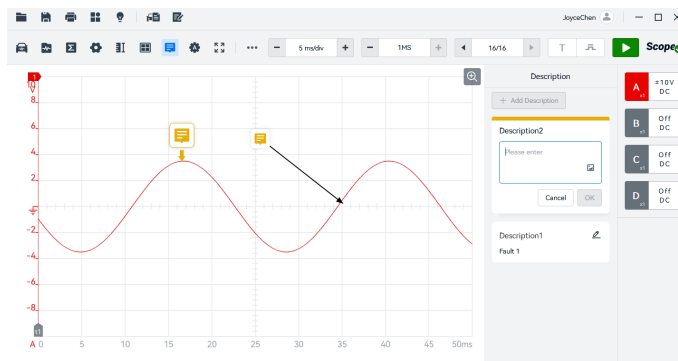


Figure 4-28 Description Screen

➤ To add descriptions

1. Click **Description** on the top toolbar to open the Description settings panel.
2. Click + **Add Description** in the settings panel. Enter the required descriptions, then click **OK**.
3. A description icon appears in the Main Section on the left side of the screen. Drag the icon to the desired location.
4. Double-click the icon. A yellow downward arrow appears.
5. Position the yellow arrow. When the pointer changes to a hand icon, click the arrow. A black downward arrow appears.
6. Position the black arrow. When the pointer changes to a + icon, click and hold the left mouse button, then drag the arrow to the desired key point on the waveform.

🔗 NOTE

The added description is saved locally and will not be displayed on the Autel Cloud platform.

➤ To delete the added descriptions

1. Click the added description icon in the Main Section to open the settings panel on the right side.
2. Click the **Edit** icon in the settings panel.

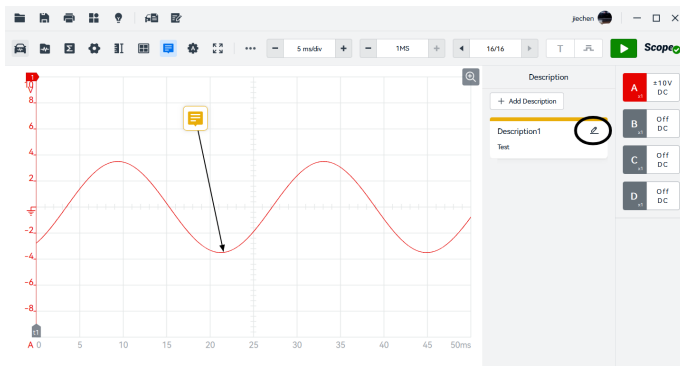


Figure 4-29 Edit Icon Screen

3. Click the **Delete** icon. A message prompt appears when you click the Delete icon. Click **OK** to confirm and delete the description.

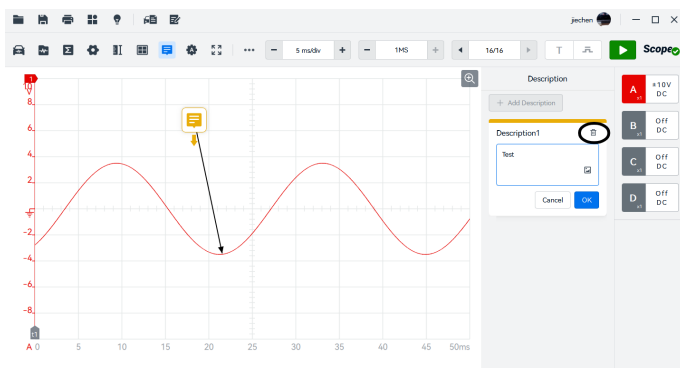


Figure 4-30 Delete Icon Screen

NOTE

The description cannot be recovered after deletion.

4.2.8 Auto Setup

The **Auto Setup** function automatically analyzes the signal on the selected channel and adjusts the vertical scale and time base settings to display the waveform properly on the screen. In auto setup settings, the time base is only valid for periodic signals.

4.2.9 Fullscreen

Click the **Fullscreen** button on the top toolbar to enter the full-screen mode. Click the

Ctrl+F11 keyboard shortcut or the **X** button on the screen to exit and return to the normal window.

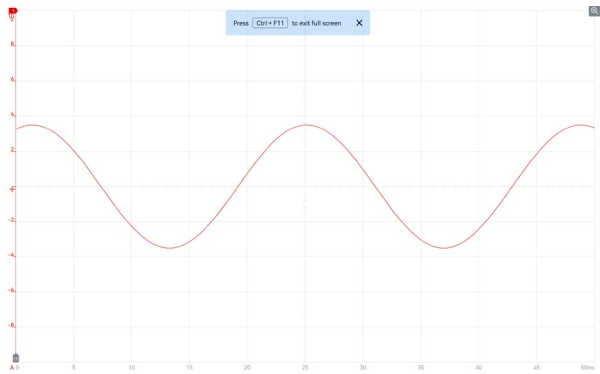


Figure 4-31 Fullscreen Screen

4.2.10 More

Click **More (...)** on the top toolbar to open the More Functions settings panel. Frequently used functions can be added to the top toolbar for quick access.

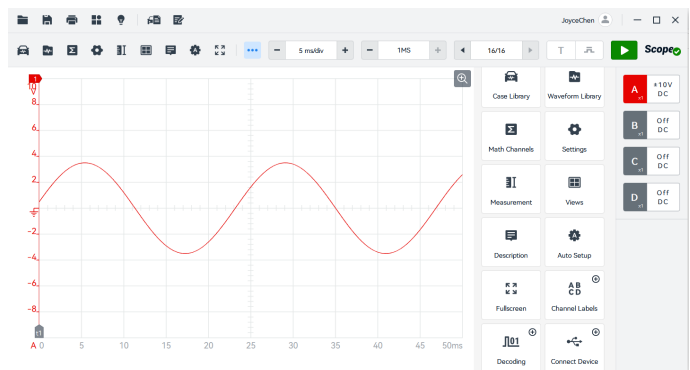


Figure 4-32 More Functions Panel Screen

The following functions support adding to and removing from the top toolbar.

Channel Labels: Displays information such as the test category, signal type, test item, and signal status for each waveform channel, making channel identification easier during measurement.

Decoding: Decodes supported serial bus signals and displays the decoded data directly on the waveform. After adding this function to the top toolbar, click the **Decoding** button

and select a protocol from the dropdown list.

Connect Device: Connects a supported oscilloscope device to the Windows PC via an Autel-compatible USB cable. After adding this function to the top toolbar, click the **Connect Device** button to select a device from the list on the screen, then click OK to confirm.

AI Formula Assistant: Uses AI to create a custom math channel or a custom probe for waveform analysis.

➤ **To add functions to the top toolbar**

1. Click **More (...)** on the top toolbar.
2. In the **More Functions** settings panel, locate the function you want to add.
3. Click the **+** icon in the upper-right corner of the function tile.

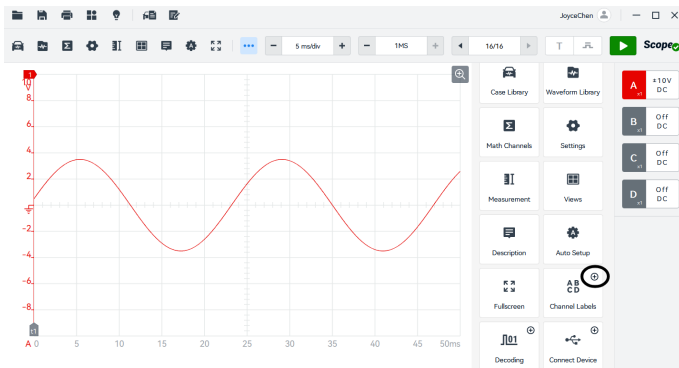


Figure 4-33 Adding Function Screen

4. The function is added to the top toolbar for quick access.

➤ **To remove the added functions from the top toolbar**

1. Click **More (...)** on the top toolbar.
2. In the **More Functions** settings panel, locate the function you want to remove.
3. Click the **-** icon in the upper-right corner of the function tile.

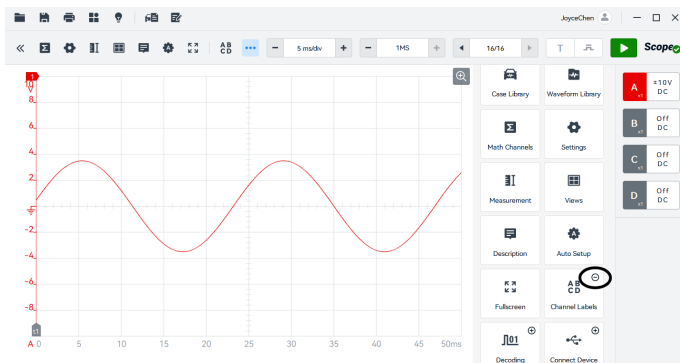


Figure 4-34 Removing Function Screen

4. The function is removed from the top toolbar.

4.2.11 Time Base

The Time Base controls the oscilloscope data sampling display time. Click the **Time Base** button on the top toolbar to open the settings panel. Configure the time base in the settings panel. Configure settings such as the sampling mode priority, target sample count, and progressive mode under the Advanced Sampling tab.

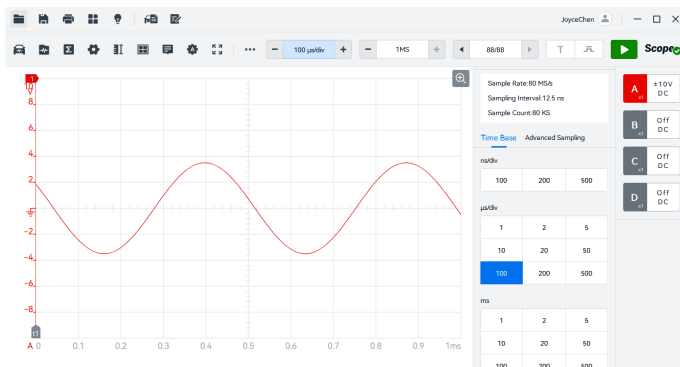


Figure 4-35 Time Base Screen (Normal Mode)

Continuous Mode: If the time base is set to more than or equal to 200ms/div, the oscilloscope switches to the continuous mode. In this mode, the oscilloscope updates the trace continuously as each capture progresses, rather than waiting for a complete capture before updating the trace.

4.2.12 Target Sample Count

Click **Target Sample Count** on the top toolbar to set the maximum number of samples to be captured for each channel.

Click the **+** or **-** icon to increase or decrease the sample count. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider. The unit can be switched in the settings dialog.

4.2.13 Waveform Playback

Waveform Playback records multiple waveform captures and allows you to review them frame by frame. It is useful for analyzing signal changes over time and comparing captured waveforms.

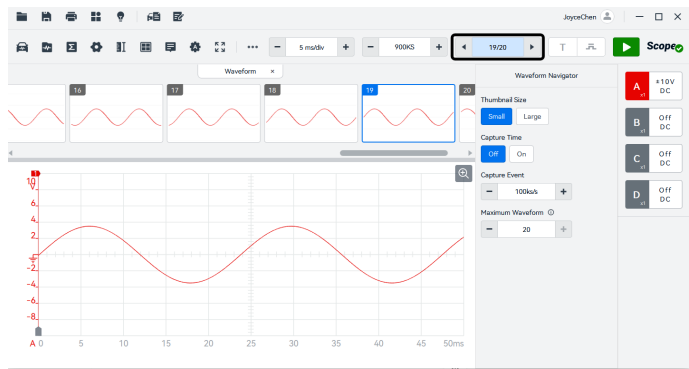


Figure 4-36 *Waveform Playback Screen*

Button	Name	Description
	Previous	Displays the previous captured waveform.
	Playback Counter	Shows the current waveform index and the total number of captured waveforms.
	Next	Displays the next captured waveform.

Click **Playback Counter** to open the Waveform Navigator screen.

Thumbnail Size: Displays the thumbnails in small or large size.

Capture Time: Displays or hides the capture time for each waveform.

Capture Event: Specifies the capture rate for waveform playback. Higher capture rates retain more waveform frames, improving the chance of capturing rare events.

Maximum Waveform: Sets the maximum number of waveforms that can be stored in the waveform buffer. The actual value depends on how many samples each waveform contains.

➤ **To configure waveform playback settings**

1. Click **Waveform Playback** on the top toolbar.
2. Set the thumbnail size.
3. Turn **Capture Time** on or off.
4. Set the **Capture Event**. Click the "+" or "-" button to adjust the value. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider.
5. Set the maximum number by clicking the "+" or "-" button to adjust the value. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider.

➤ **To review captured waveforms**

1. Acquire waveforms.
2. Click the **Previous** or **Next** button to switch between waveforms.
3. Or click **Waveform Playback** on the top toolbar. Select a thumbnail or use the playback controls to review individual waveforms.

4.2.14 Trigger

Trigger: Used to filter and capture specified waveform data. According to the trigger settings condition, the trigger waveform will be captured when the signal meets the trigger condition. When capturing waveforms, you can manually set the trigger conditions. This oscilloscope supports multiple trigger modes and trigger types.

Table 4-3 Trigger Mode Table

Trigger Mode	Description
None	The oscilloscope can continuously capture data without waiting for a trigger event.

Trigger Mode	Description
Auto	The oscilloscope will wait for a trigger before capturing data. It can automatically update after a short period, even if the signal does not cross the trigger point.
Repeat	The oscilloscope waits until a trigger event occurs. If there is no trigger event, nothing will be displayed on the screen.
Single	The oscilloscope stops capturing data once a trigger event occurs.

The oscilloscope supports the following trigger types:

- Edge Trigger
- Advanced Edge
- Window
- Pulse Width (+)
- Interval
- Window Pulse Width
- Horizontal Distortion
- Window Distortion
- Runt

When the oscilloscope is capturing the signal, click the left column of the **Trigger** button to activate the trigger function. A **trigger point** will be shown as a blue triangle.

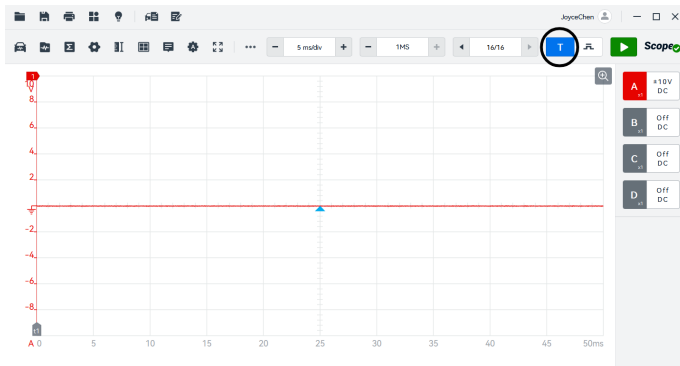


Figure 4-37 Trigger On/Off Button Screen

When the oscilloscope is capturing the signal, click the right column of the **Trigger** button to open the trigger settings panel. Select a trigger type in the dropdown list.

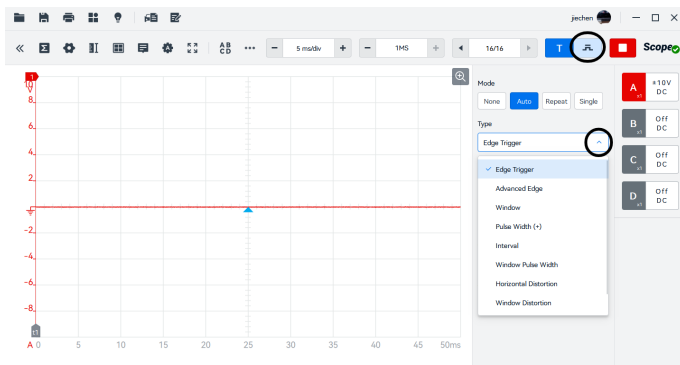


Figure 4-38 Trigger Settings Screen

✧ Edge Trigger

Triggers when the signal crosses the specified threshold on either a rising or falling edge. This is the most common trigger type for observing periodic signals. This trigger type allows you to configure the trigger mode, channel, direction, threshold, and trigger horizontal position settings.

NOTE

The oscilloscope switches to the continuous mode if the time base is set to more than or equal to 200 ms/div. The Edge Trigger is supported in the continuous mode.

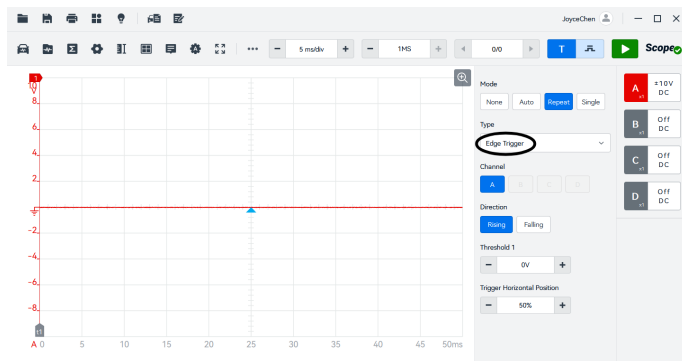


Figure 4-39 Edge Trigger Settings Screen

Channel: Select the applicable trigger input channel. The selected channel is the one that the oscilloscope monitors for the trigger condition.

Direction: Specify which signal edge generates the trigger event. Two direction settings are available: **Rising** and **Falling**.

- **Rising** — indicates the trigger is turned on to start the trace on the rising edge of the waveform.
- **Falling** — indicates the trigger is turned on to start the trace on the falling edge of the waveform

Threshold 1: Sets the voltage threshold for the trigger. To precisely position the trigger point, input the value in the Threshold field. To roughly position, directly drag the trigger point to a desired position.

Trigger Horizontal Position: Sets the horizontal location of the trigger point within the waveform display. For example, 50% indicates that the trigger point is at the center of the display.

➤ To configure the trigger settings

1. Select **Edge Trigger** from the Type dropdown list.
2. Select the trigger mode, trigger channel, and direction.
3. Adjust the threshold value by clicking the "+" or "-" button. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider. The unit can be switched to **kV**, **V**, or **mV** in the settings dialog.
4. Click the "+" or "-" button to adjust the trigger horizontal position. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider.

✧ **Advanced Edge**

This trigger type includes all the functions of the edge trigger type, plus two additional options: the **Either** option and the **hysteresis** option.

Either: Either **Rising** or **Falling** direction can be triggered. This mode is especially useful for monitoring pulses of both polarities at once.

Hysteresis: Used to reduce false triggering on noisy signals. When hysteresis is enabled, a second trigger threshold voltage is used in addition to the main trigger threshold. The trigger fires only when the signal crosses the two thresholds in the correct order. The first threshold arms the trigger, and the second causes it to fire.

✧ **Window**

This trigger type is used to monitor when the signal enters or exits a specified voltage window.

Three options are available: **Enter**, **Exit**, and **Either** (either Enter or Exit). **Threshold 1** and **Threshold 2** are the upper and lower voltage limits of the window.

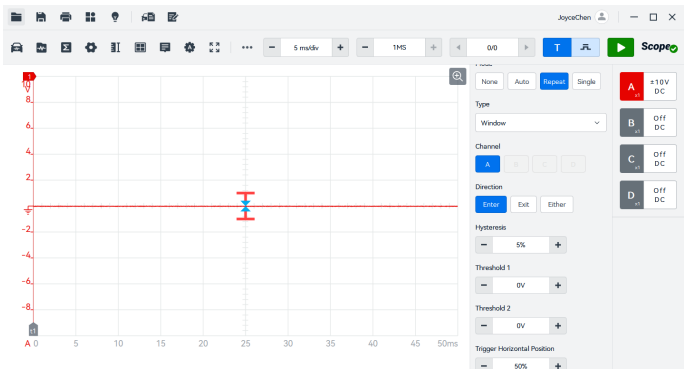


Figure 4-40 Window Settings Screen

✧ **Pulse Width (+)**

This trigger type allows you to monitor pulses of a specified width.

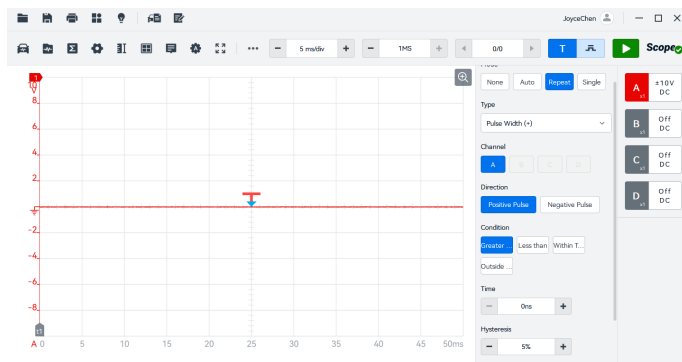


Figure 4-41 Pulse Width Settings Screen

➤ **To set the pulse width (+)**

1. Select the **Pulse Width (+)** from the Type dropdown list.
2. Select the desired trigger mode and channel.
3. Set the direction to either **Positive Pulse** or **Negative Pulse** according to the polarity of the pulse.
4. Select one of the four Conditions:
 - **Greater than:** triggers on pulses greater than the specified time.
 - **Less than:** triggers on pulses less than the specified time.
 - **Within Time Range:** triggers on pulses greater than Time 1 and less than Time 2.
 - **Outside Time Range:** triggers on pulses less than Time 1 or greater than Time 2.
5. Set the trigger **Time (Time 1 and Time 2 if available)**, **Hysteresis**, **Threshold**, and **Trigger Horizontal Position** by clicking the "+" or "-" button. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider. The unit can be switched in the settings dialog.

✧ **Interval**

This trigger type allows you to search for two consecutive edges of the same polarity separated by a specified time interval.

Refer to the Pulse Width (+) operation steps for the general procedure. For Direction, select **Rising** or **Falling** rather than **Positive Pulse** or **Negative Pulse**.

✧ **Window Pulse Width**

This trigger type combines with the Window Trigger and the Pulse Width Trigger. It

detects when a signal enters or exits an input range and stays for a specified period of time. Two direction options can be selected: **In range** and **Out of range**.

✧ **Horizontal Distortion**

This trigger type can be monitored when the signal goes high or low for longer than the specified time.

✧ **Window Distortion**

This trigger type monitors when a signal enters a specified voltage range and stays within that range for a specified period of time.

✧ **Runt**

This trigger type monitors a pulse that exceeds one threshold and then falls below that threshold without exceeding the second threshold. This type of trigger is typically used to find pulses that do not reach a valid logic level.

4.2.15 Start/Stop Button

Button	Name	Description
	Start	Starts the oscilloscope and initiates sampling.
	Stop	Stops the oscilloscope and terminates sampling.

4.2.16 Scope Icon

This icon displays the oscilloscope connection status. A green check mark means the Windows PC and the oscilloscope are connected successfully. A red “X” shows the disconnection status.

4.3 Main Section

Each trace has two control features, the **X-axis** and the **Y-axis**, which enable you to adjust the oscilloscope settings to suit the measurement. If multiple traces are displayed at the same time, the **Y-axis** for each trace is adjusted separately while the **X-axis** is the same for all traces.

- ✓ **Y-axis** — the voltage level is recorded on the vertical line. It displays on the left side

of the screen.

- ✓ **X-axis** — time is presented on the horizontal line. It is shown along the bottom of the screen.

4.3.1 Measurement Overrange Indicator

When the amplitude exceeds the measurement input range, a **red overrange indicator** with the message **"Over Range"** is displayed in the top-left corner of the screen. Exceeding the common-mode input range may result in inaccurate measurements and can lead to severe signal distortion.

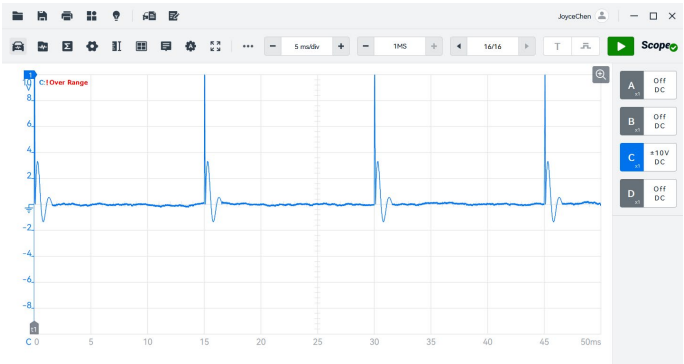


Figure 4-42 Overrange Indicator Screen

Select an appropriate scale setting for the signal being sampled to avoid an overrange condition.

! IMPORTANT

To prevent electric shock, do not exceed the voltage limits between inputs.

4.3.2 Zero Baseline

The zero baseline is marked at 0 value on the Y-axis, indicating the ground level of each channel waveform.

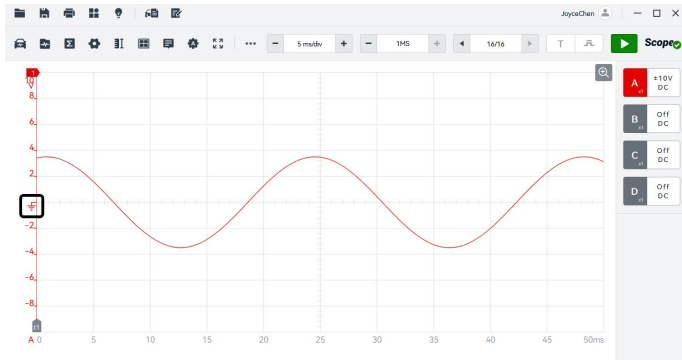


Figure 4-43 Zero Baseline Screen

When the mouse cursor on the left side of the Y-axis changes to a vertical double-headed arrow, drag the arrow up or down to adjust the zero baseline. The displayed waveform will follow the baseline movement simultaneously.

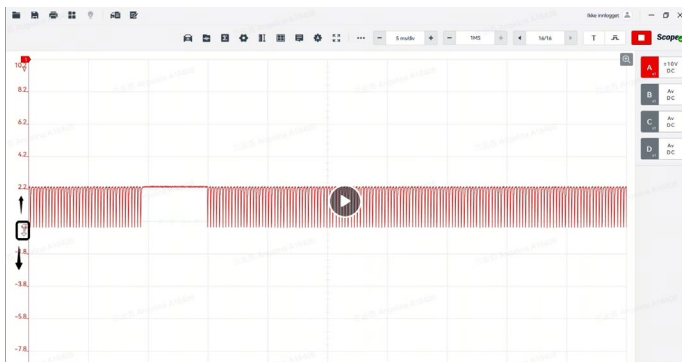


Figure 4-44 Adjusting Zero Baseline Screen

4.3.3 Waveform Moving

When the mouse cursor on the left side of the Y-axis changes to a vertical double-headed arrow (see [Figure 4-44](#)), drag the arrow up or down to move the displayed waveform up or down. The zero baseline moves correspondingly in tandem with the waveform.

4.3.4 Waveform Zooming

The zooming function allows you to enlarge or reduce the waveform display and move the viewed area during waveform acquisition or after a waveform has been captured for detailed analysis. It does not change the stored data, but the way it is displayed.

There are two ways to open the Zoom window:

Method 1: Using the Mouse Wheel

Scroll the mouse wheel to zoom in or zoom out on the waveform directly. After zooming, the Zoom window appears in the upper-left corner, displaying the zoomed waveform view.

Method 2: Using the Zoom Icon

Click the **Zoom** icon in the upper-right corner of the Main Section to open the Zoom window. The Zoom window appears in the upper-left corner, allowing you to adjust the waveform view.

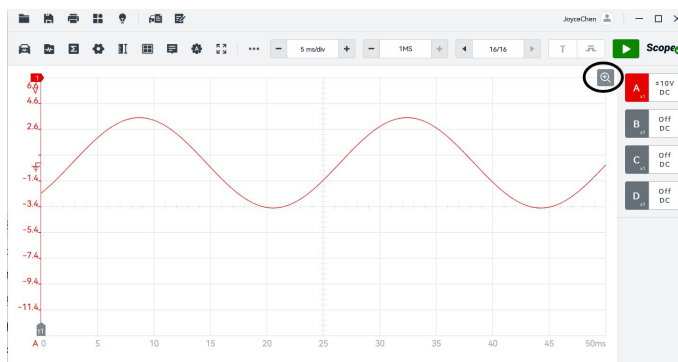


Figure 4-45 Zoom Icon

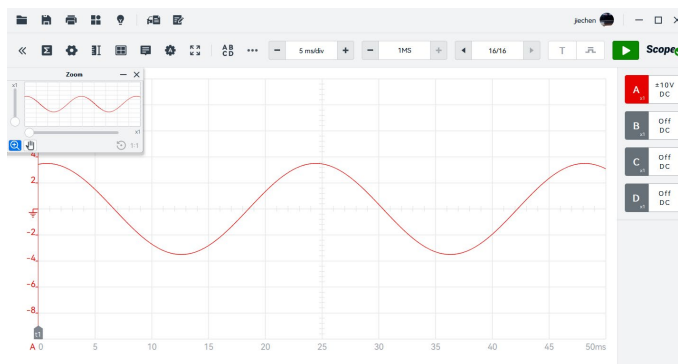


Figure 4-46 Zoom Window Screen

After opening the Zoom window, drag the vertical slider to adjust the zoom level, and drag the horizontal slider to move the zoomed view area. Select the hand-shaped icon to enable mouse wheel zooming. Click **x** to close the Zoom window.

4.3.5 Measurement Rulers

The Ruler function allows precise measurements of waveform parameters such as time, amplitude, and phase. Locate the **Ruler Activator** in the lower-left or upper-left corner of the grid. When the mouse cursor changes to a vertical or horizontal double-headed arrow, drag the arrow up/down or left/right to generate a ruler. For more details, see [Rulers](#).

4.4 Side Toolbar

By default, the side toolbar displays the Channel Control buttons for configuring input channel settings. When a function is selected from the Menu Bar or Top Toolbar, the related configuration panel also appears in the side toolbar.

4.4.1 Channel Control

There are four input channels: **input channel A**, **input channel B**, **input channel C**, and **input channel D**. Configure the input channel(s) through the corresponding channel control button(s).

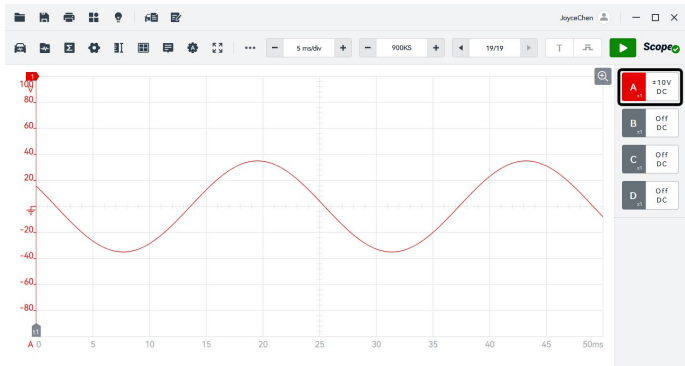


Figure 4-47 Channel Control Button

Configure the settings such as Amplitudes, Probes, Low Pass Filters, and Display for each channel. The probe name is displayed in the lower-right corner of the left column of a channel control button. The amplitude is displayed in the right column of a channel control button.

➤ **To activate and close the channel**

1. Click the left column of the channel control button to activate the channel. The button color changes from gray to the corresponding default color.

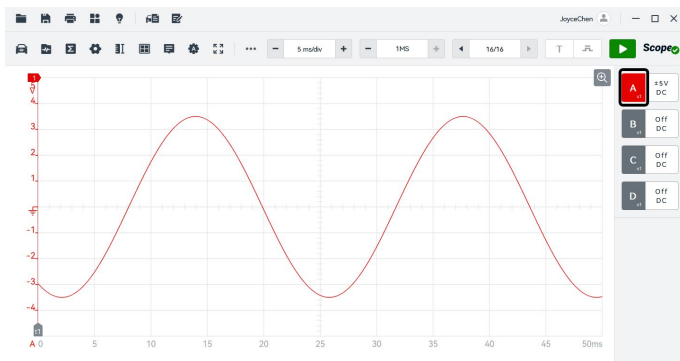


Figure 4-48 Activate Channel Screen

2. Click the right column of the channel control button to open the settings panel.

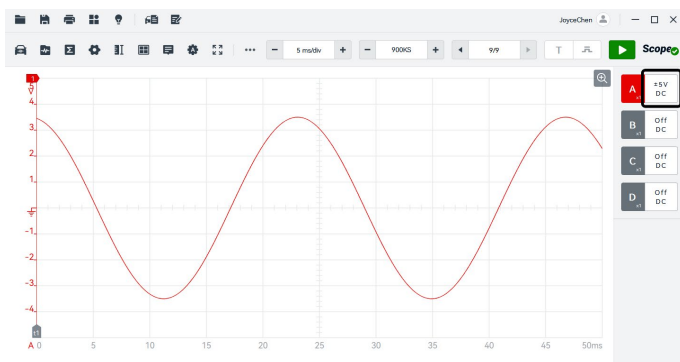


Figure 4-49 Channel Settings Panel Access

3. Click the left column of the channel control button again to disable the channel. The disabled channel button displays gray.

✧ Default Channel Color

Table 4-4 Default Channel Color Table

Input Channel	Color
A	Red
B	Green

Input Channel	Color
C	Blue
D	Yellow

4.4.2 Amplitude Settings

The amplitude, probe, low-pass filter, and display settings can be configured in the channel settings panel, which is opened by clicking the right column of a channel control button.

The amplitude settings allow you to set up the oscilloscope to capture signals with the specified range. If the input signal exceeds the selected range, an over-range indicator will be displayed. Select **Auto** to enable the device to adjust the vertical scale automatically.

The vertical scale will be changed, while the horizontal scale will not be changed. AC and DC voltage can be toggled to set up the input circuitry.

NOTE

The vertical scale is ALWAYS divided into 10 major divisions, and all scale settings reflect in these 10 divisions. The division set of 10 cannot be changed.

There are two modes available to set the amplitude value.

Mode 1: For example, selecting **DC 5V** sets the channel amplitude to $\pm 5V$ DC (displayed on the right side of the channel control button), and the vertical scale range is from $-5V$ to $+5V$. The vertical scale is divided into 10 segments, so each segment increases by $1V$.

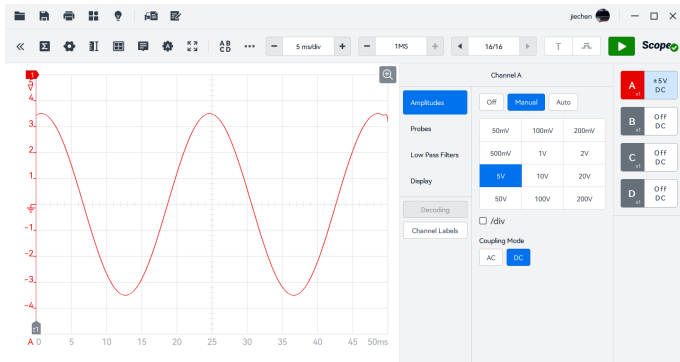


Figure 4-50 Amplitude Settings Screen (DC 5 V)

Mode 2: Select the **## /div** button to adjust the value incremented by each division. For example, selecting **DC 2.0V/div** sets the channel amplitude to 2.0V/div DC (displayed on the right side of the channel control button). Each segment increases by 2V. As the vertical scale is divided into 10 segments, the full range is from -10V to +10V.

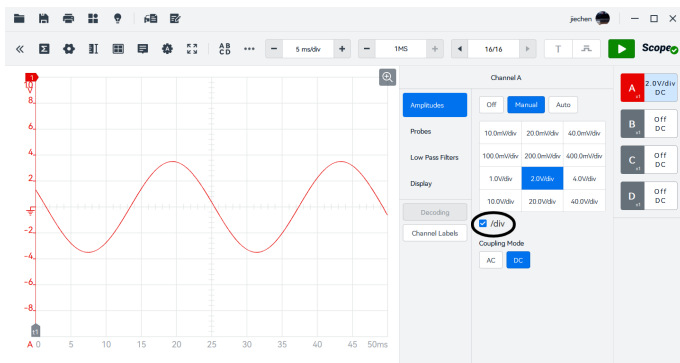


Figure 4-51 Amplitude Settings Screen (DC 2.0V/div)

4.4.3 Probe Settings

A probe is used to acquire signals from the circuit under test and deliver them to the oscilloscope for measurement.

This oscilloscope has built-in definitions of standard probes. By default, the probe attenuation is set to $\times 1$, meaning no attenuation is applied. A 1V signal at the probe tip is displayed as 1V.

The built-in probes include:

- ✓ **X1:** no attenuation
- ✓ **10:1 Attenuator:** select when using a 10-fold attenuation probe
- ✓ **20:1 Attenuator:** select when using a 20-fold attenuation probe
- ✓ **x1000:** select when using a 1,000-fold attenuation probe
- ✓ **x10000:** select when using a 10,000-fold attenuation probe
- ✓ **65 A Current Clamp (1 mV/10 mA mode, Max: 20 A):** 1 mV/10 mA mode on 65 A current clamp, the max. current is 20 A
- ✓ **65 A Current Clamp (1 mV/100 mA mode, Max: 65 A):** 1 mV/100 mA mode on 65 A current clamp, and the max. current is 65 A
- ✓ **650 A Current Clamp (1 mV/100 mA mode, Max: 200 A):** 1 mV/100 mA mode on 650 A current clamp, and the max. current is 200 A
- ✓ **650 A Current Clamp (1 mV/1 A mode, Max: 650 A):** 1 mV/1 A mode on 650 A current clamp, the max. current is 650 A
- ✓ **COP Ignition Probe:** select when using the COP (Coil-On-Plug) ignition probe
- ✓ **Secondary Ignition Probe (ignition):** select when using the secondary ignition probe
- ✓ **Secondary Ignition Reversal Probe (R_ignition):** select when using the secondary ignition probe and inverting the secondary ignition signal

Click the question mark icon on the right of the built-in probe to view the image of the corresponding current clamp.

You can select the built-in probes in the probe settings panel. After selecting a correct probe, the settings will display in the lower-right corner of the left column of the channel control button, indicating the probe is in use.

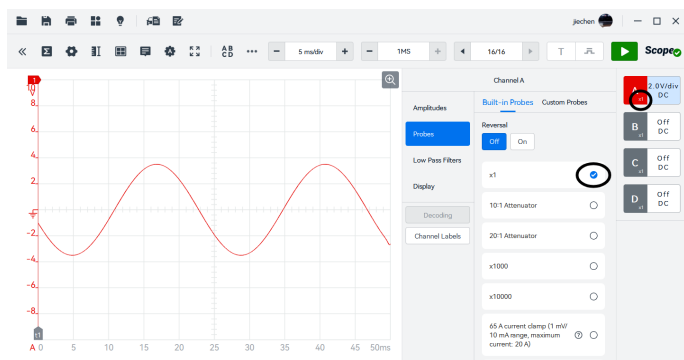


Figure 4-52 Built-in Probe Settings Screen

✧ Custom Probes

Click the **Custom Probes** tab to add probes that are not included in the built-in probe menu.

NOTE

Please refer to the probe's instruction manual or consult the corresponding manufacturer for the linear equation ($y=mx+c$).

➤ To add custom probes

1. Click the right column of the channel control button to open the settings panel.
2. Select **Probes > Custom Probes** in the settings panel. Click **+ Add Probe** to open a settings dialog.

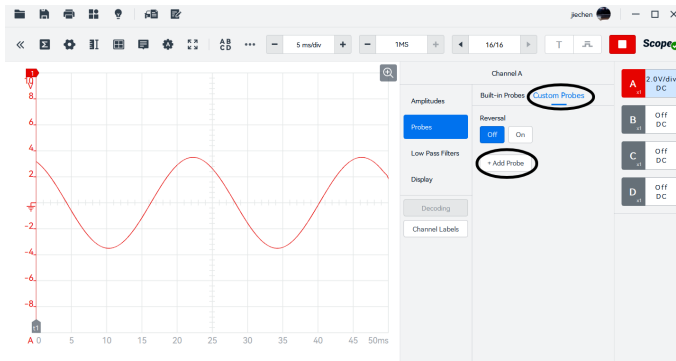


Figure 4-53 Adding Custom Probe Screen

3. Enter the required information.
4. Click **OK** to save the settings, or click **Cancel** to exit without saving.

4.4.4 Low Pass Filters

The Low Pass Filter (LPF) is an independent digital low-pass filter for each input channel used to remove noise from the signal.

This function is used to filter the high-frequency signal of the selected input channel for more accurate measurements. The following screenshots show the difference between waveforms with the low-pass filtering and waveforms without the low-pass filtering.

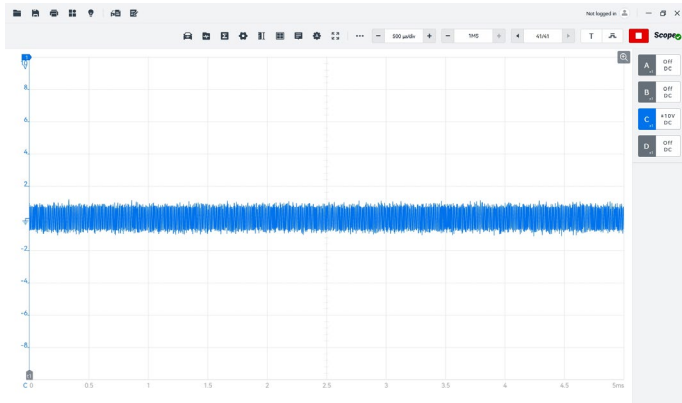


Figure 4-54 Before Setting Low-pass Filtering Screen

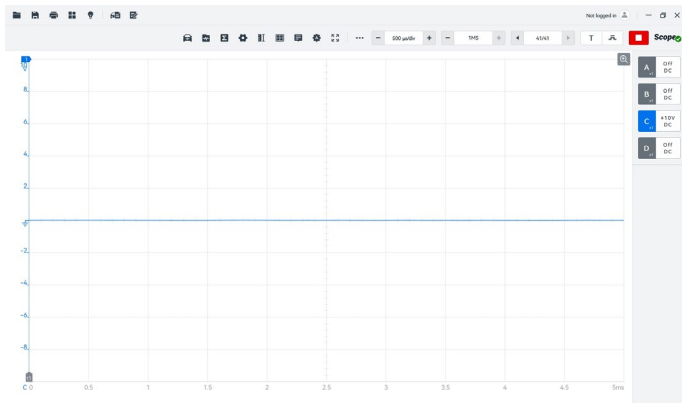


Figure 4-55 After Setting Low-pass Filtering Screen

➤ **To configure the low-pass filtering settings**

1. Click the right column of the channel control button to open the settings panel.
2. Select the **Low Pass Filters** option in the settings panel.
3. Click **On/Off** to enable or disable the function.
4. Click the "+" or "-" button to adjust the frequency value. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider. The unit can be switched to **Hz**, **KHz**, or **MHz** in the settings dialog.

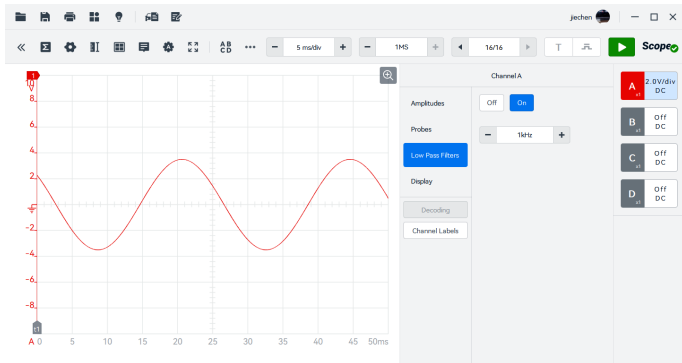


Figure 4-56 Low Pass Filter Settings Screen

4.4.5 Display

This section allows you to customize the display settings for the selected channel. You can set a channel alias, adjust the scale ratio, configure the display offset, and customize the waveform color.

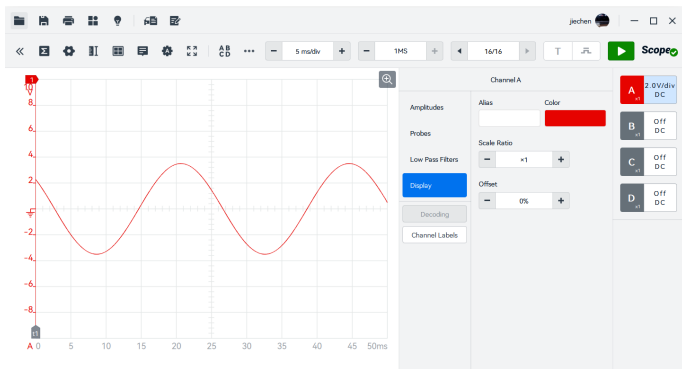


Figure 4-57 Display Settings Screen

Alias: Enter a custom name for the selected channel. It does not affect signal acquisition.

Color: Select the waveform display color for the selected channel.

Scale Ratio: Select the probe attenuation ratio of the connected probe.

Offset: Moves the waveform up or down on the display.

➤ To configure the waveform display

1. Click the right column of the channel control button to open the settings panel.

2. Enter a custom name for the selected channel.
3. Click to change the waveform display color.
4. Click the "+" or "-" button to adjust the scale ratio value and offset value. Alternatively, click the value to open the settings dialog, then enter the desired value or drag the slider.

4.5 Troubleshooting

- A.** If the oscilloscope cannot communicate with the PC:
- Ensure the oscilloscope is properly connected to the PC with the supplied USB cable.
 - Restart the PC and reconnect the devices if communication between the two continues to fail.
- B.** If unwanted signals are displayed or signals are distorted:
- Use only the supplied test leads or probes to connect to the input channels.
 - Check the test leads or probes for damage.
 - Ensure the polarity of the test lead connections is correct.
 - Ensure the signal and ground connections are clean and secure.
 - Ensure that the ground lead provides a direct connection between the circuit ground and the oscilloscope ground.
 - Isolate the test leads from other components, leads, or systems that may induce unwanted noise into the signal being tested, including the electric motors, secondary ignition components, relays, and alternators.

4.6 Glossary

AC/DC Control

Each channel can be set to either AC coupling or DC coupling. With DC coupling, the voltage displayed onscreen is equal to the true voltage of the signal with respect to ground. With AC coupling, any DC component of the signal is filtered out, leaving only the variations in the signal for the AC component.

Aliasing

When the signal frequency gets higher than half the scope's maximum sampling rate and exceeds the limit, a distorted waveform displays. This distortion is called aliasing.

Amplitude

The maximum voltage generated from the zero volts line of the oscilloscope.

Analog Bandwidth

The frequency at which a displayed sine wave has half the power of the input sine wave (about 71% of the amplitude).

Buffer Size/Cache Size

The size of the oscilloscope's buffer memory. The buffer memory is used by the oscilloscope to temporarily store data. This helps to compensate for the differences in data transfer rate from one device to another.

Frequency

The number of signal occurrences per second. Frequency is measured in Hz (hertz).

Peak to peak voltage

The difference in voltage between the minimum and maximum voltages occurring in the waveform.

Time Base

The time interval across the scope display.

Voltage Range

The range between the maximum and minimum voltages that can be accurately captured by the oscilloscope.

Sampling Rate

The number of samples per second captured by the oscilloscope. The faster the sampling rate of the scope, the more frequently it measures the signal voltage, and so the more detailed waveforms are displayed on the scope screen.

5 Service

5.1 Technical Support

If you have any questions or problems with the operation of the product, please contact us (see the following contact info) or your local distributor.

Autel China Headquarters

- **Phone:** +86 (0755) 8614-7779 (Monday-Friday, 9AM-6PM Beijing Time)
- **Email:** support@autel.com
- **Address:** Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili Sub-district, Nanshan District, Shenzhen City, China
- **Web:** www.autel.com

Autel North America

- **Phone:** 1-855-288-3587 (Monday-Friday, 9AM-6PM Eastern Time)
- **Email:** ussupport@autel.com
- **Address:** 36 Harbor Park Drive, Port Washington, New York, USA 11050
- **Web:** www.autel.com/us

Autel Europe

- **Phone:** +49(0)89 540299608 (Monday-Friday, 9AM-6PM Berlin Time)
- **Email:** support.eu@autel.com
- **Address:** Landsberger Str. 408, 81241 München, Germany
- **Web:** www.autel.eu

Autel APAC

Japan:

- **Phone:** +81-045-548-6282
- **Email:** support.jp@autel.com
- **Address:** 6th Floor, Ari-nadoribiru 3-7-7, Shinyokohama, Kohoku-ku, Yokohama-shi, Kanagawa-ken, 222-0033 Japan
- **Web:** www.autel.com/jp

Australia:

- **Email:** ausupport@autel.com
- **Address:** Unit 5, 25 Veronica Street, Capalaba

Autel IMEA

- **Phone:** +971 585 002709 (in UAE)
- **Email:** imea-support@autel.com
- **Address:** 906-17, Preatoni Tower (Cluster L), Jumeirah Lakes Tower, DMCC, Dubai, UAE
- **Web:** www.autel.com

Autel Latin America

Mexico:

- **Phone:** +52 33 1001 7880 (Spanish in Mexico)
- **Email:** latsupport@autel.com
- **Address:** Avenida Americas 1905, 6B, Colonia Aldrete, Guadalajara, Jalisco, Mexico

Brazil:

- **Email:** brsupport@autel.com
- **Address:** Avenida José de Souza Campos n° 900, sala 32 Nova Campinas Campinas – SP, Brazil
- **Web:** www.autel.com/br

5.2 Repair Service

If it becomes necessary to return your device for repair, please download the repair service form from www.autel.com, and fill it in. The following information must be included:

- Contact name
- Return address
- Telephone number
- Product name
- Complete description of the problem
- Proof-of-purchase for warranty repairs
- Preferred method of payment for non-warranty repairs

 NOTE

For non-warranty repairs, payment can be made with Visa, Master Card, or with approved credit terms.

Send the device to your local agent, or to the address below:

Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili Sub-district, Nanshan District, Shenzhen City, China

5.3 Other Services

You can purchase the optional accessories directly from Autel's authorized tool suppliers, and/or your local distributor or agent.

Your purchase order should include the following information:

- Contact information
- Product or part name
- Item description
- Purchase quantity

6 Compliance Information

6.1 FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

WARNING

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

6.2 ICES Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

6.3 CE Compliance

2014/35/EU Low Voltage and 2014/30/EU Electromagnetic Compatibility.

6.4 RoHS Compliance

This device is declared to be in compliance with the European RoHS Directive 2011/65/EU and Commission Delegated Directive (EU) 2015/863 and all subsequent amendments, restricting the use of hazardous substances in electrical and electronic equipment.

7 Warranty

7.1 Limited One Year Warranty

Autel Intelligent Technology Corp., Ltd. (the Company) warrants to the original retail purchaser of this Autel MaxiScope MP608, that should this product or any part thereof during normal consumer usage and conditions, be proven defective in material or workmanship that results in product failure within one (1) year period from the date of purchase, such defect(s) will be repaired, or replaced (with new or rebuilt parts) with Proof of Purchase, at the Company's option, without charge for parts or labor directly related to the defect(s).

NOTE

If the warranty period is inconsistent with local laws and regulations, please comply with the relevant local laws and regulations.

The Company shall not be liable for any incidental or consequential damages arising from the use, misuse, or mounting of the device. Some states do not allow limitation on how long an implied warranty lasts, so the above limitations may not apply to you.

This warranty does not apply to:

- a) Products subjected to abnormal use or conditions, accident, mishandling, neglect, unauthorized alteration, misuse, improper installation or repair or improper storage;
- b) Products whose mechanical serial number or electronic serial number has been removed, altered or defaced;
- c) Damage from exposure to excessive temperatures or extreme environmental conditions;
- d) Damage resulting from connection to, or use of any accessory or other product not approved or authorized by the Company;
- e) Defects in appearance, cosmetic, decorative or structural items such as framing and non-operative parts.
- f) Products damaged from external causes such as fire, dirt, sand, battery leakage, blown fuse, theft or improper usage of any electrical source.

IMPORTANT

All contents of the product may be deleted during the process of repair. You should create a backup copy of any content of your product before delivering the product for warranty service.

