RIGOL

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ISO 9001 QUALITY MANAGEMENT
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ESTABLISHED OVER 50 YEARS SINCE 1966
01189 786911 TELONIC.CO.UK

SUA8000 Series

Digital Transceiver

Quick Guide

Jun. 2025

Guaranty and Declaration

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Contact Us

If you have any problem or requirement when using our products or this manual, please contact RIGOL.

E-mail: service@rigol.com

Website: *http://www.rigol.com*

1 Safety Requirement

1.1 General Safety Summary

Please review the following safety precautions carefully before putting the instrument into operation so as to avoid any personal injury or damage to the instrument and any product connected to it. To prevent potential hazards, please follow the instructions specified in this manual to use the instrument properly.

1. Only the exclusive power cord designed for the instrument and authorized for use within the destination country could be used.
2. Ensure that the instrument is safely grounded.
3. Observe all terminal ratings.
4. Use proper overvoltage protection.
5. Do not operate without covers.
6. Do not insert objects into the air outlet.
7. Use the proper fuse.
8. Avoid circuit or wire exposure.
9. Do not operate the instrument with suspected failures.
10. Provide adequate ventilation.
11. Do not operate in wet conditions.
12. Do not operate in an explosive atmosphere.
13. Keep instrument surfaces clean and dry.
14. Prevent electrostatic impact.
15. Handle with caution.

WARNING

Equipment meeting Class A requirements may not offer adequate protection to broadcast services within residential environment.

1.2 Safety Notices and Symbols

Safety Notices in this Manual:

WARNING

Indicates a potentially hazardous situation or practice which, if not avoided, will result in serious injury or death.

CAUTION

Indicates a potentially hazardous situation or practice which, if not avoided, could result in damage to the product or loss of important data.

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Safety Notices on the Product:

- **DANGER**

  It calls attention to an operation, if not correctly performed, could result in injury or hazard immediately.

- **WARNING**

  It calls attention to an operation, if not correctly performed, could result in potential injury or hazard.

- **CAUTION**

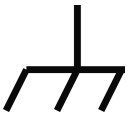
  It calls attention to an operation, if not correctly performed, could result in damage to the product or other devices connected to the product.

Safety Symbols on the Product:

Hazardous Voltage

Safety Warning

Protective Earth Terminal



Chassis Ground

Test Ground

1.3 Measurement Category

Measurement Category

This instrument can make measurements in Measurement Category I.

WARNING

This instrument can only be used for measurements within its specified measurement categories.

Measurement Category Definitions

- **Measurement category I** is for measurements performed on circuits not directly connected to MAINS. Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS derived circuits. In the latter case, transient stresses are variable. Thus, you must know the transient withstand capability of the equipment.
- **Measurement category II** is for measurements performed on circuits directly connected to low voltage installation. Examples are measurements on household appliances, portable tools and similar equipment.
- **Measurement category III** is for measurements performed in the building installation. Examples are measurements on distribution boards, circuit-breakers, wiring (including cables, bus-bars, junction boxes, switches and socket-outlets) in the fixed installation, and equipment for industrial use and some other

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equipment. For example, stationary motors with permanent connection to a fixed installation.

- **Measurement category IV** is for measurements performed at the source of a low-voltage installation. Examples are electricity meters and measurements on primary overcurrent protection devices and ripple control units.

1.4 Ventilation Requirement

This instrument uses a fan to force cooling. Please make sure that the air inlet and outlet areas are free from obstructions and have free air. When using the instrument in a bench-top or rack setting, provide at least 10 cm clearance beside, above and behind the instrument for adequate ventilation.

CAUTION

Inadequate ventilation may cause an increase of temperature in the instrument, which would cause damage to the instrument. So please keep the instrument well ventilated and inspect the air outlet and the fan regularly.

1.5 Working Environment

Temperature

Operating: 0℃ to +50℃

Non-operating: -30℃ to +70℃

Humidity

- **Operating:**

  Below +30℃: ≤90% RH (without condensation)

  +30℃ to +40℃: ≤75% RH (without condensation)

  +40℃ to +50℃: ≤45% RH (without condensation)

- **Non-operating:**

  Below +65℃: ≤90% RH (without condensation)

WARNING

To avoid short circuit inside the instrument or electric shock, never operate the instrument in a humid environment.

Altitude

- **Operating:** below 3 km
- **Non-operating**: below 15 km

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Protection Level Against Electric Shock

ESD ±8kV

Installation (Overvoltage) Category

This product is powered by mains conforming to installation (overvoltage) category II.

WARNING

Ensure that no overvoltage (such as that caused by a bolt of lightning) can reach the product. Otherwise, the operator might be exposed to the danger of an electric shock.

Installation (Overvoltage) Category Definitions

Installation (overvoltage) category I refers to signal level which is applicable to equipment measurement terminals connected to the source circuit. Among these terminals, precautions are done to limit the transient voltage to a low level.

Installation (overvoltage) category II refers to the local power distribution level which is applicable to equipment connected to the AC line (AC power).

Pollution Degree

Pollution Degree 2

Pollution Degree Definition

- **Pollution Degree 1:** No pollution or only dry, nonconductive pollution occurs. The pollution has no effect. For example, a clean room or air-conditioned office environment.
- **Pollution Degree 2:** Normally only nonconductive pollution occurs. Temporary conductivity caused by condensation is to be expected. For example, indoor environment.
- **Pollution Degree 3:** Conductive pollution or dry nonconductive pollution that becomes conductive due to condensation occurs. To be found in industrial environment or construction sites (harsh environments). For example, sheltered outdoor environment.
- **Pollution Degree 4:** The pollution generates persistent conductivity caused by conductive dust, rain, or snow. For example, outdoor areas.

Safety Class

Class 1 – Grounded Product

1.6 Care and Cleaning

Care

Do not store or leave the instrument where it may be exposed to direct sunlight for long periods of time.

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Cleaning

Clean the instrument regularly according to its operating conditions.

1. Disconnect the instrument from all power sources.
2. Clean the external surfaces of the instrument with a soft cloth dampened with mild detergent or water. Avoid having any water or other objects into the chassis via the heat dissipation hole. When cleaning the LCD, take care to avoid scarifying it.

CAUTION

To avoid damage to the instrument, do not expose it to caustic liquids.

WARNING

To avoid short-circuit resulting from moisture or personal injuries, ensure that the instrument is completely dry before connecting it to the power supply.

1.7 Environmental Considerations

The following symbol indicates that this product complies with the WEEE Directive 2012/19/EU.

The equipment may contain substances that could be harmful to the environment or human health. To avoid the release of such substances into the environment and avoid harm to human health, we recommend you to recycle this product appropriately to ensure that most materials are reused or recycled properly. Please contact your local authorities for disposal or recycling information.

You can click on the following link *https://int.rigol.com/services/services/declaration* to download the latest version of the RoHS&WEEE certification file.

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2 Document Overview

This document is intended to provide a quick overview of the front and rear panels, user interface and basic operation of the SUA8000 series digital transceiver.

NOTE

For the newest version of this manual, download it from **RIGOL** official website (*www.rigol.com*).

Publication Number

QGK01000-1110

Content Conventions in this Manual

SUA8000 series digital transceiver includes the following models. Unless otherwise specified, this manual takes SUA8304 as an example to illustrate the functions and operation methods of SUA8000 series.

Model	No. of Transmitting Channels	No. of Receiving Channels	Max. Analog Bandwidth
SUA8104	4	0	3.5 GHz
SUA8204	0	4	1.5 GHz
SUA8208	0	8	1.5 GHz
SUA8304	2	2	3.5 GHz
SUA8104G	4	0	3.5 GHz
SUA8204G	0	4	1.5 GHz
SUA8208G	0	8	1.5 GHz
SUA8304G	2	2	3.5 GHz

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3 General Inspection

1. **Inspect the packaging**

   If the packaging has been damaged, do not dispose the damaged packaging or cushioning materials until the shipment has been checked for completeness and has passed both electrical and mechanical tests.

   The consigner or carrier shall be liable for the damage to the instrument resulting from shipment. RIGOL would not be responsible for free maintenance/rework or replacement of the instrument.

2. **Inspect the instrument**

   In case of any mechanical damage, missing parts, or failure in passing the electrical and mechanical tests, contact your RIGOL sales representative.

3. **Check the accessories**

   Please check the accessories according to the packing lists. If the accessories are damaged or incomplete, please contact your RIGOL sales representative.

Recommended Calibration Interval

RIGOL suggests that the instrument should be calibrated every 12 months.

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4 Product Overview

The SUA8000 series digital transceiver combines arbitrary waveform generation, signal acquisition and waveform recording, designed for complex signal applications. The series features a modular architecture but is offered in standard configurations, ensuring a convenient out-of-the-box experience with superior reliability and consistency.

Unless otherwise specified, this chapter takes SUA8304 as an example to introduce the front panel, rear panel, and user interface (display) of the SUA8000 series.

4.1 Front Panel Overview

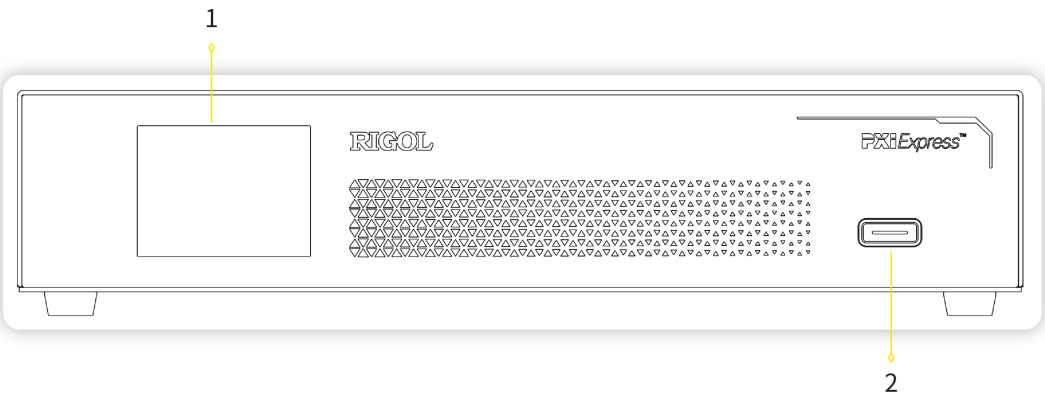

Figure 4.1 Front Panel

1	Operation Status Display	2	Power Key

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4.2 Rear Panel Overview

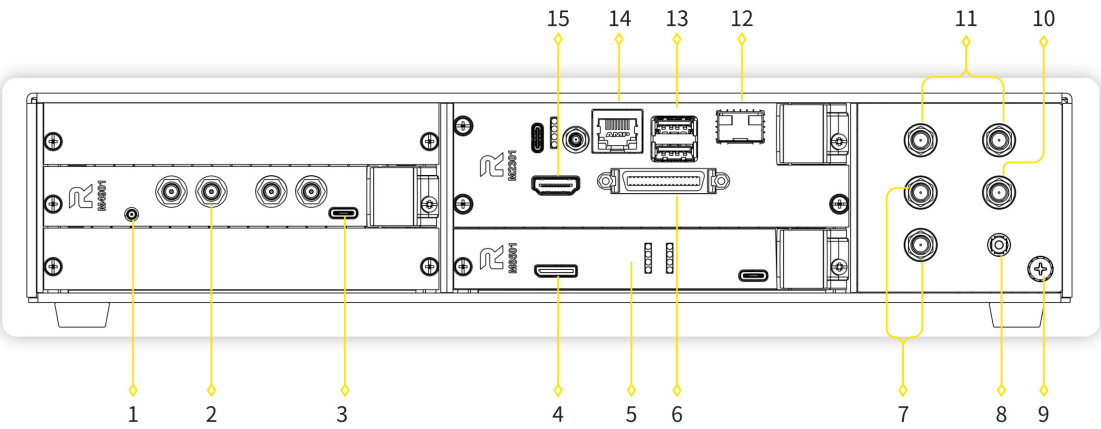

Figure 4.2 Rear Panel

1	Sample Clock Input Interface	9	Ground Terminal
2	Analog Channel Input Output Terminals	10	10 MHz Clock Input Interface
3	Type-C JTAG Connector	11	100 MHz Clock Input/Output Interface
4	PCIe X4 Expansion Interface	12	10 Gigabit Ethernet SFP+ Interface
5	16 TB Storage Expansion Module	13	USB3.0 Interface
6	GPIO Interface	14	Gigabit Ethernet LAN Interface
7	Trigger Input/Output	15	HDMI Interface
8	19.5V/ DC Power Socket		

NOTE

The SUA8208 and SUA8208G adopts 8-channel RF integrated connectors for analog channel I/O terminals, while other series products use 4 SMA connectors.

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4.3 User Interface Overview

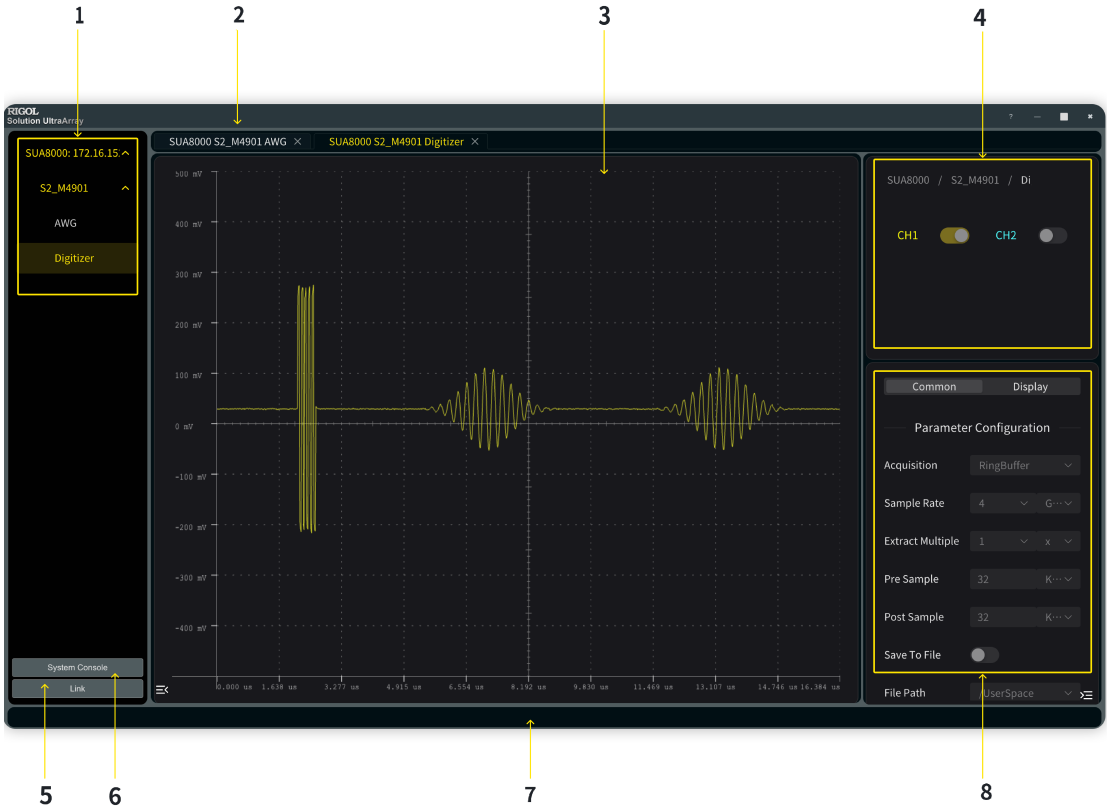

Figure 4.3 Main User Interface

1	Device Selection Area	5	Device Link
2	Selected Device Display	6	System Console
3	Waveform Display Area	7	Run Log Display Area
4	Channel Selection Area	8	Parameter Configuration Area

NOTE

The SUA8304 and SUA8304G integrate the function of a Digitizer and an AWG. Other series only have the function of an AWG or a Digitizer. After the interface is displayed, click Link and the function control window pops up.

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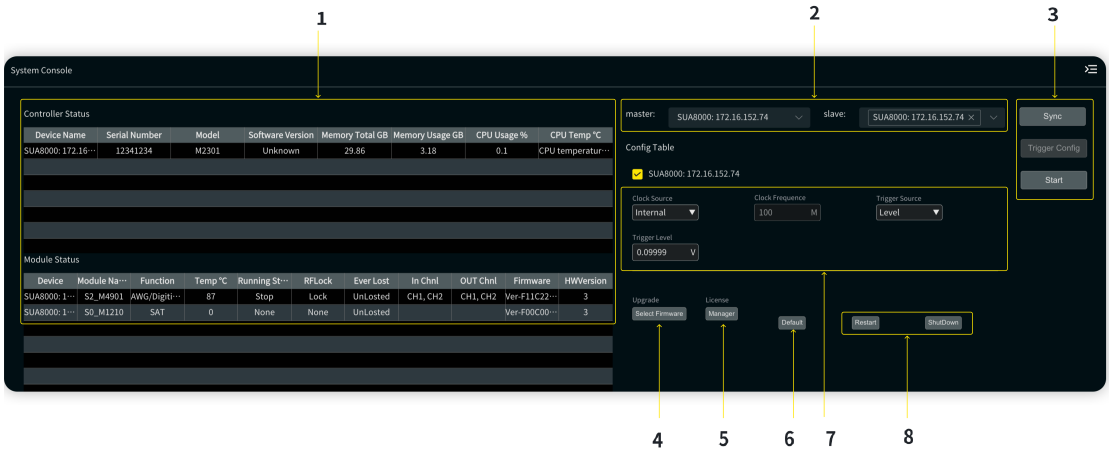

Figure 4.4 System Console Interface

1	System Information	5	License Management
2	Device Selection	6	Factory Default
3	System Control	7	Clock/Trigger Configuration
4	Firmware Upgrade	8	Restart/Shut Down

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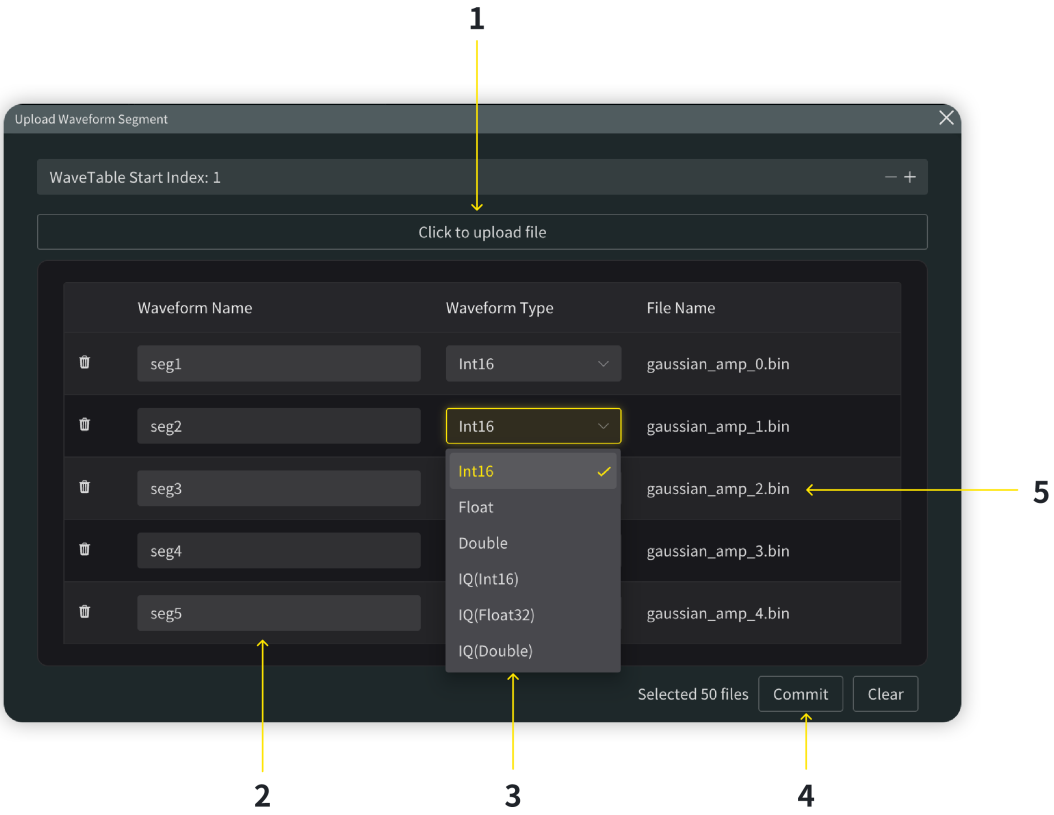

Figure 4.5 AWG Waveform File Import Interface

1	Waveform File Selection	4	Waveform File Upload
2	Waveform Segment Name	5	Waveform File Name
3	Waveform File Data Type		

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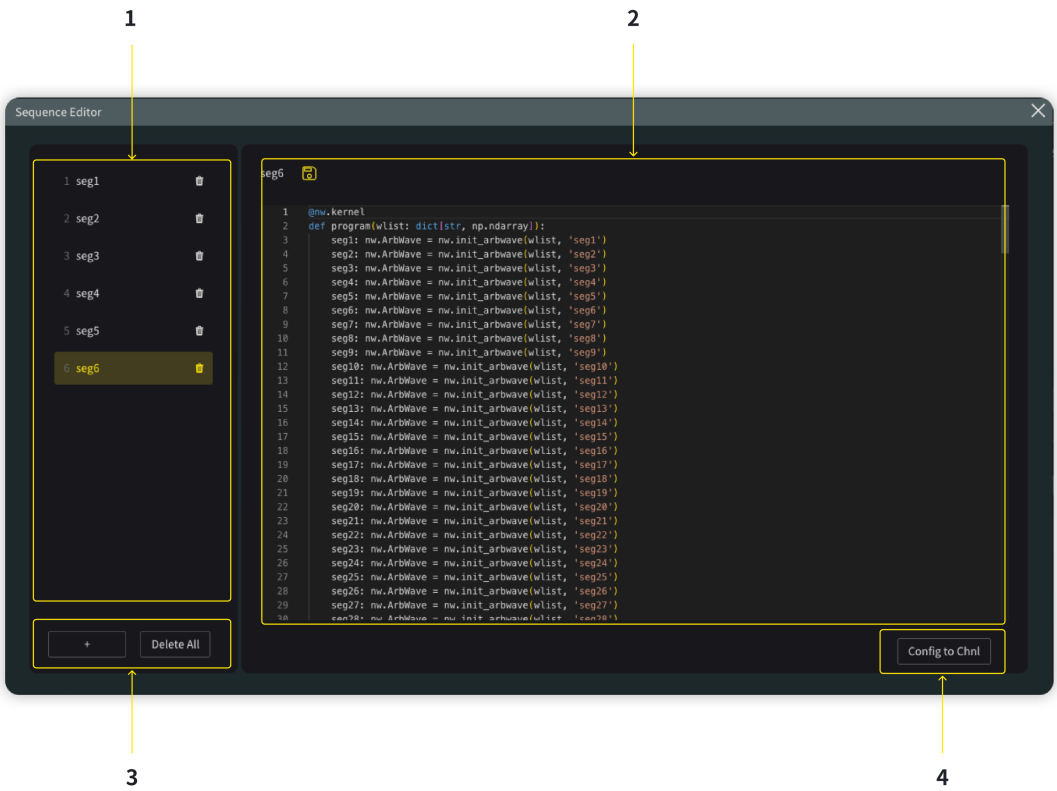

Figure 4.6 AWG Advanced Waveform Sequence Editing Interface

1	Advanced Sequence Management Area	3	Advanced Sequence Add/Delete
2	Advanced Sequence Editing Area	4	Advanced Sequence Channel Configuration

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5 To Prepare for Use

5.1 To Connect to Power

Connect the device to the power by using the power adapter and power cable supplied in the accessory, as shown in the figure below. The device supports 20 V DC input, and the power adapter has a maximum output power of 240 W and supports AC power input with specifications of 100 V-120 V and 200 V-240 V at 50 Hz to 60 Hz.

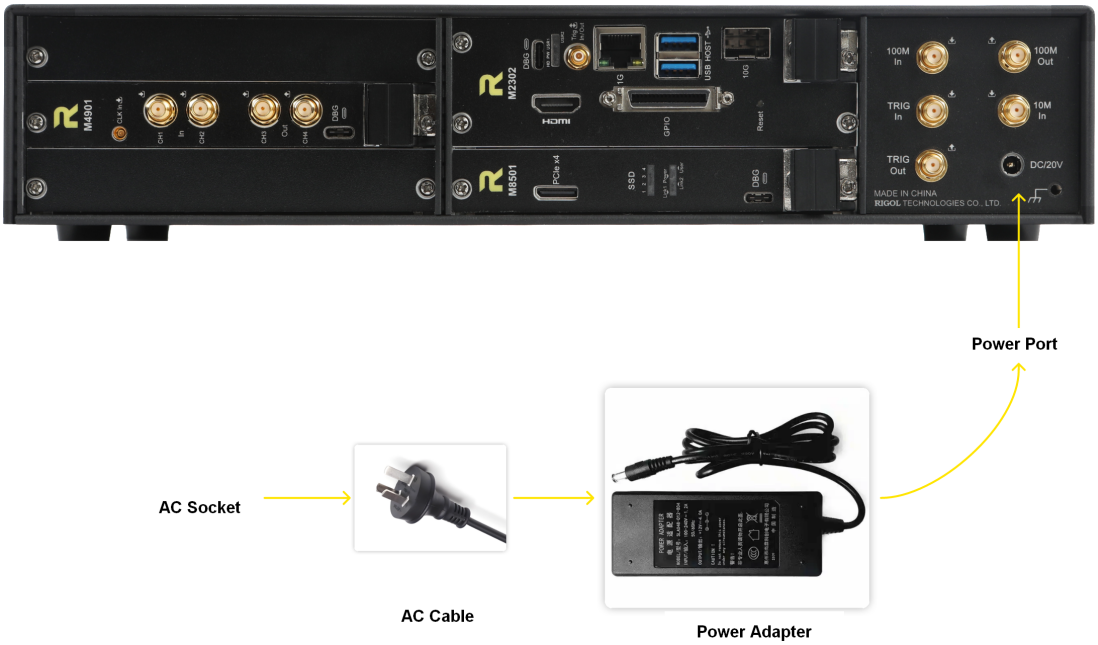

Figure 5.1 Connect to Power

WARNING

To avoid electric shock, please ensure that the instrument is correctly grounded.

5.2 Turn-on Checkout

When the device is properly connected to the power supply, connect the instrument to the display via an HDMI cable. Press the power key at the lower-right corner of the front panel to power on the instrument. During the start-up process, the instrument performs a series of self-tests. After the self-test, the splash screen is displayed. Connect the mouse and keyboard to the device through USB interface for control.

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- Restart: Click **System Console** > **Restart**, and then click **Confirm** in the displayed menu to restart the instrument.
- Shutdown: Click **System Console** > **ShutDown**, and then click **Confirm** in the displayed menu to shut down the instrument.

Figure 5.2 Display Connection

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6 Unpacking and Inspection

This chapter introduces the methods to enable the SUA8000 and to perform the loop-back test after the unpacking. This manual takes the SUA8304/SUA8304G as an example to perform tests, and other models can be tested with RIGOL signal generators or oscilloscopes.

6.1 Hardware Connection

Connect the AWG output terminal with the Digitizer input terminal on the SUA8304/SUA8304G via SMA coaxial cable to form a test loop. Play arbitrary waveform sequence files on the AWG window, and view the acquired signal waveform on the Digitizer window.

1. First, connect the device to the power through the power adapter.
2. Create a test loop by connecting Input1 to Output1 and Input2 to Output2 with SMA coaxial cables.
3. Connect the SUA8304/SUA8304G to the master control computer with an Ethernet cable. SUA8000 supports both remote control of the instrument and local control with the screen via HDMI interface. The operating procedure is identical for both modes, and this document describes the remote network access mode.
4. Connect the SUA8304/SUA8304G to your monitor with an HDMI cable.
5. The hardware connection diagram is shown below. After confirming that all instruments are correctly connected, press down the power key to turn on the device.

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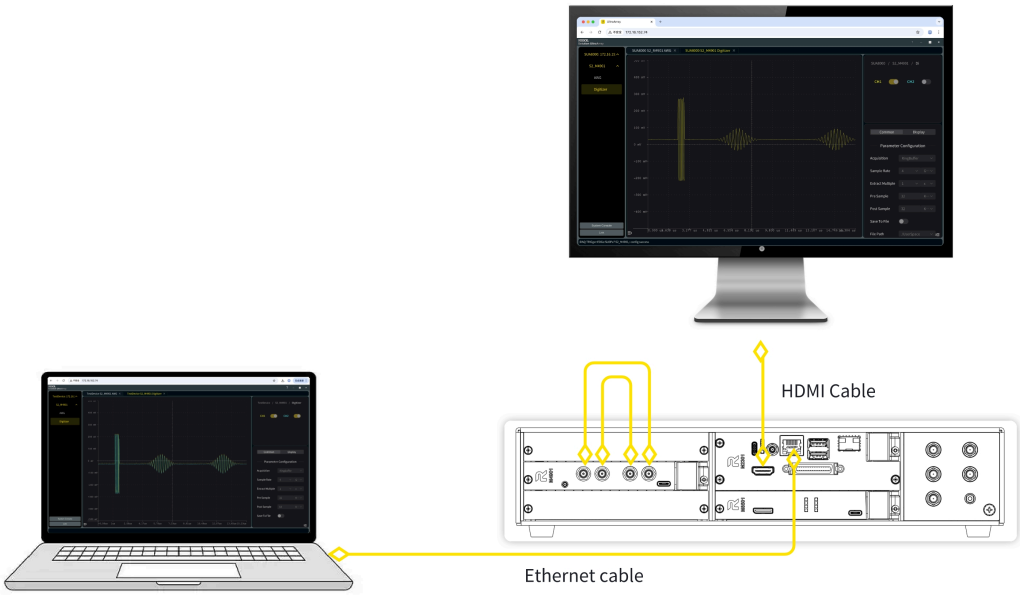
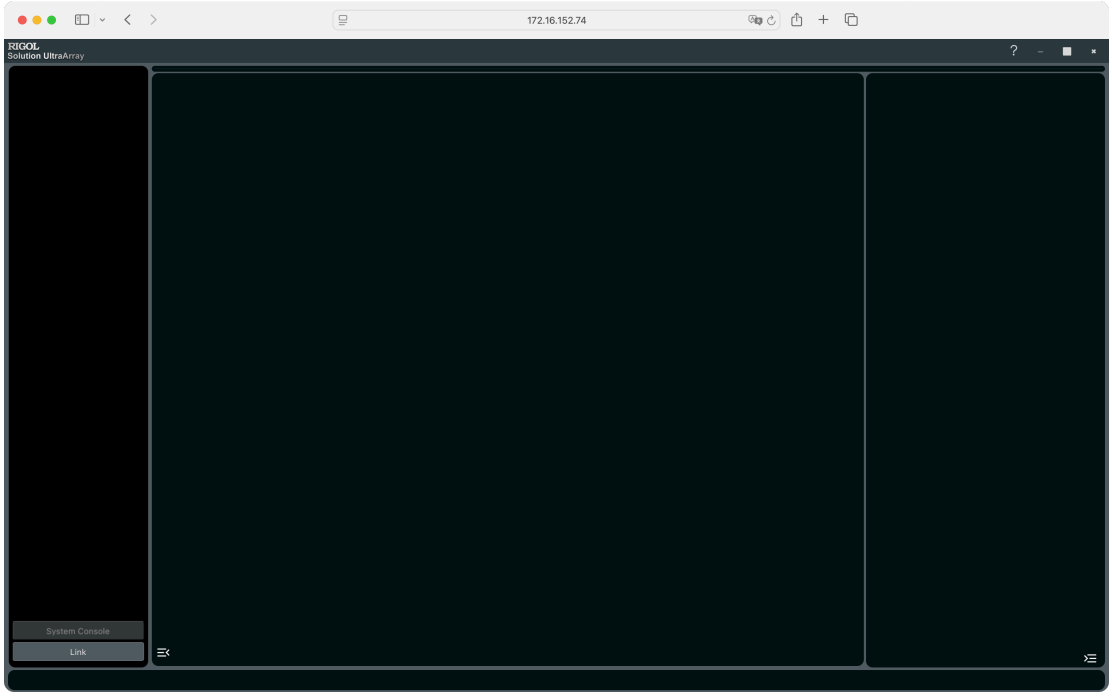


6.2 Software Operation

1. Obtain the IP address from the front panel display of the SUA8000 device, then enter the IP address in the browser of the host computer to access the SUA8000 control console.



2. Click the Link button in the lower-left corner, and the Add Device window is displayed on the screen.

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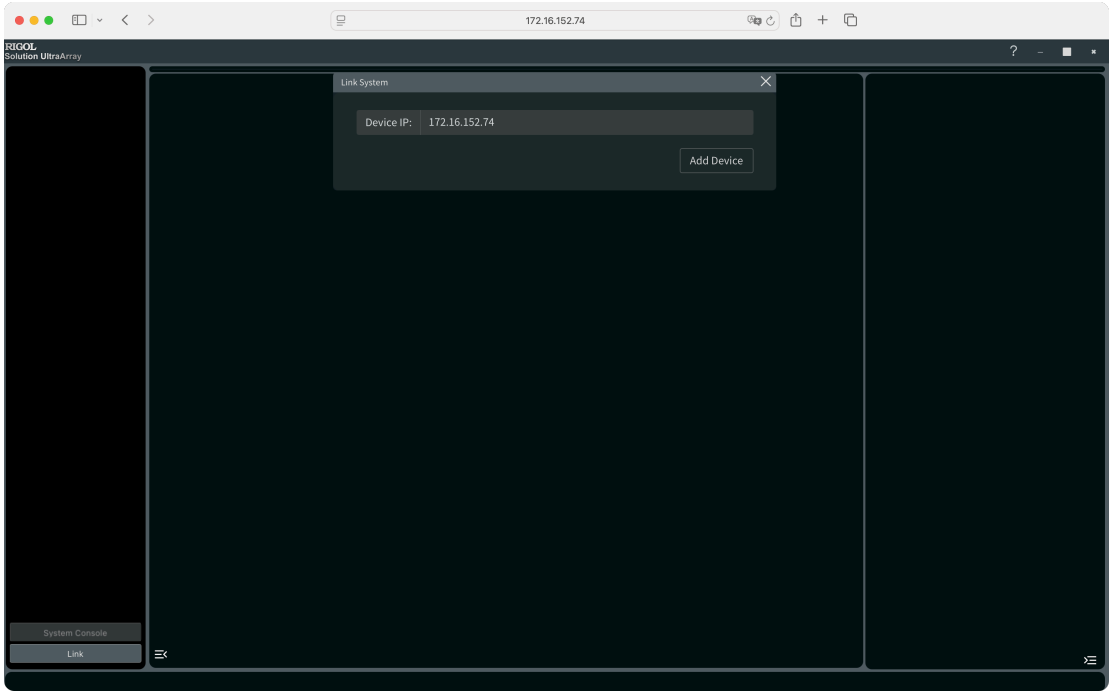
3. Enter the same IP address in the Device IP field as used in the browser, then click Add Device to enter the device management interface.



4. The SUA8304/SUA8304G integrates the 2-channel AWG and 2-channel digitizer. The software correspondingly displays AWG (Arbitrary Waveform Generator) and Digitizer interfaces.

5. In the AWG interface, 50 waveform files and 2 advanced sequence waveform files have been added for the unpacking test by default.

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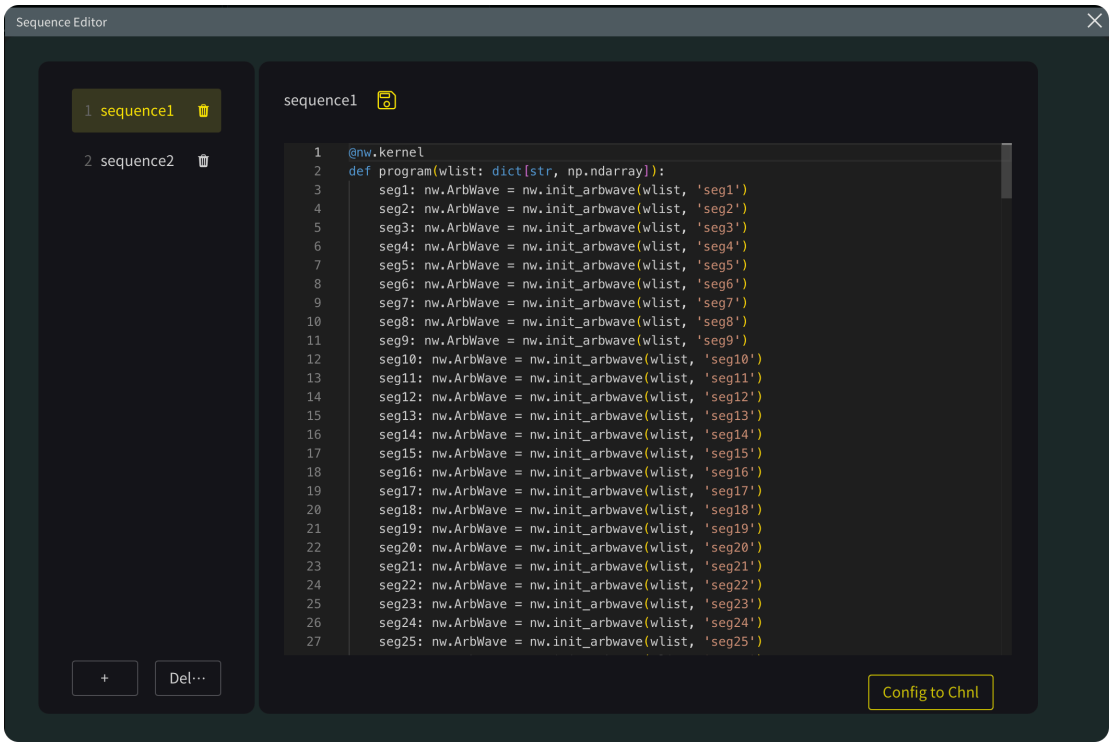
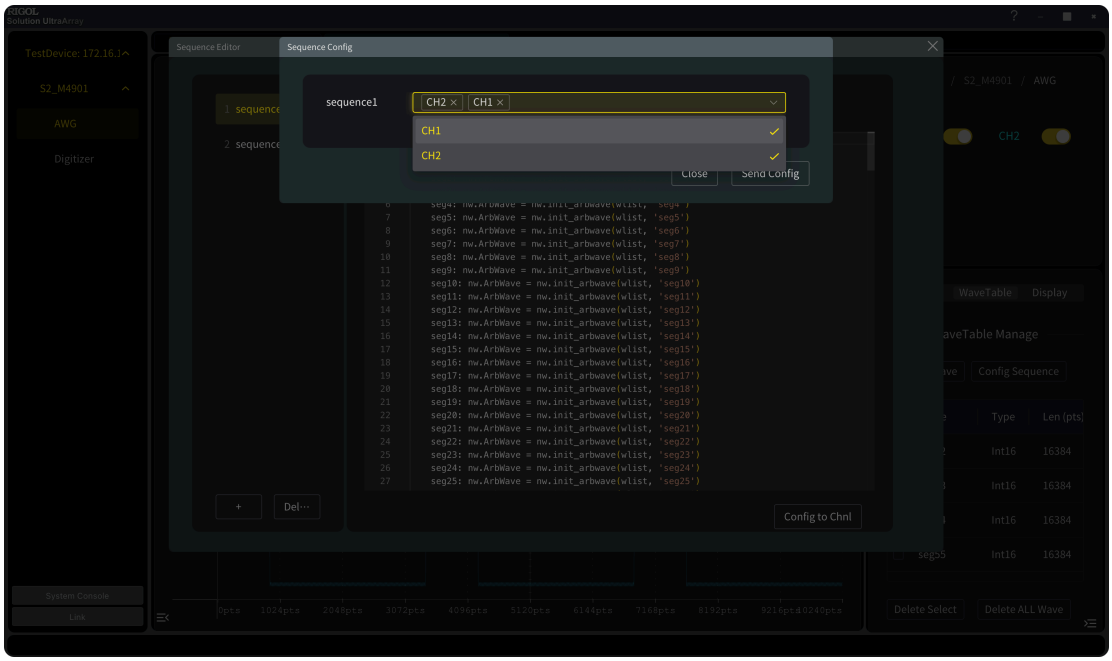
6. Click the Config Sequence button at the lower-right of the screen to open the waveform sequence editor.



7. Click the Config to Chnl button in the lower-right corner of the screen to quickly map the waveform sequence to the channel, completing the channel configuration for playing advanced sequence waveform files.

8. Configure Sequence1 waveform files to both channel 1 and channel 2, and click the Send Config button to issue the configuration.



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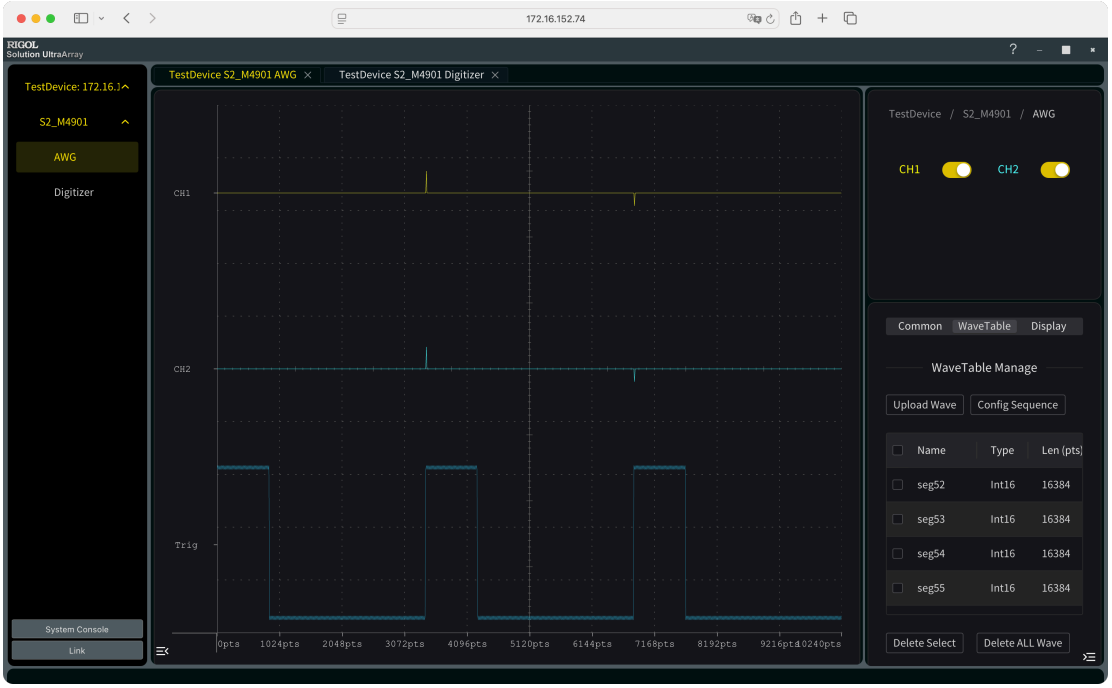
9. After the configuration is completed, the AWG interface will display the simulation waveforms of CH1, CH2 and Trigger signal according to the currently configured waveform sequence.
10. Confirm that CH1 and CH2 channels are enabled in the upper-right corner of the screen.



11. Click Digitizer to switch to the Digitizer interface. Keep all parameters at their default values.
12. Click System Console to enter the System Console interface (as shown in the following figure).

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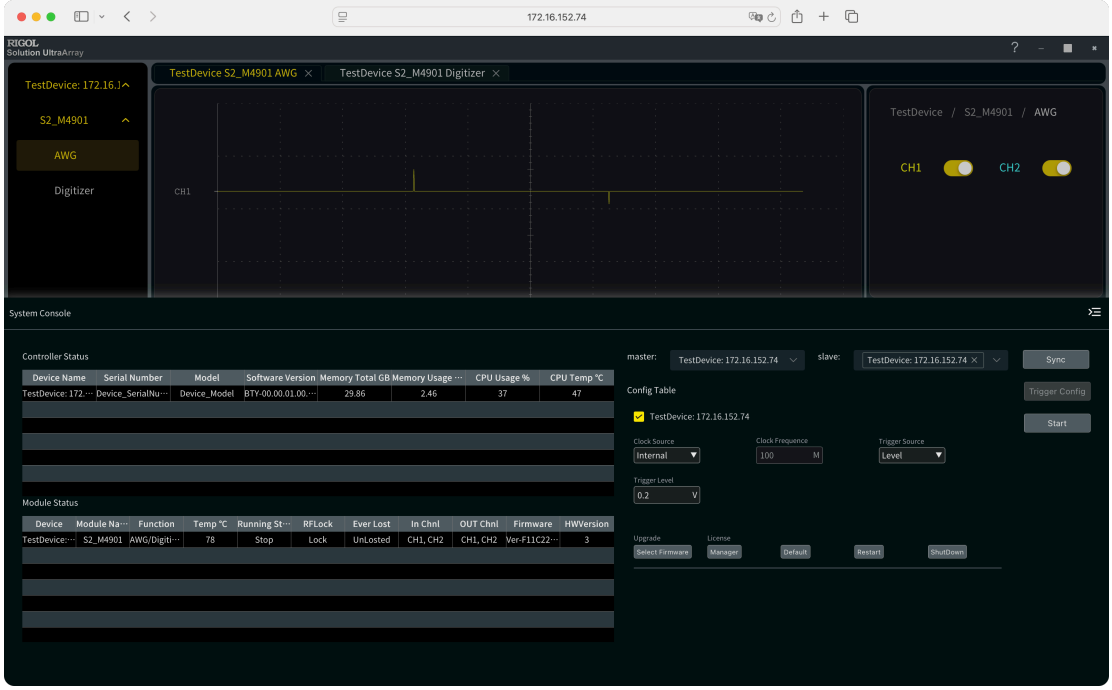
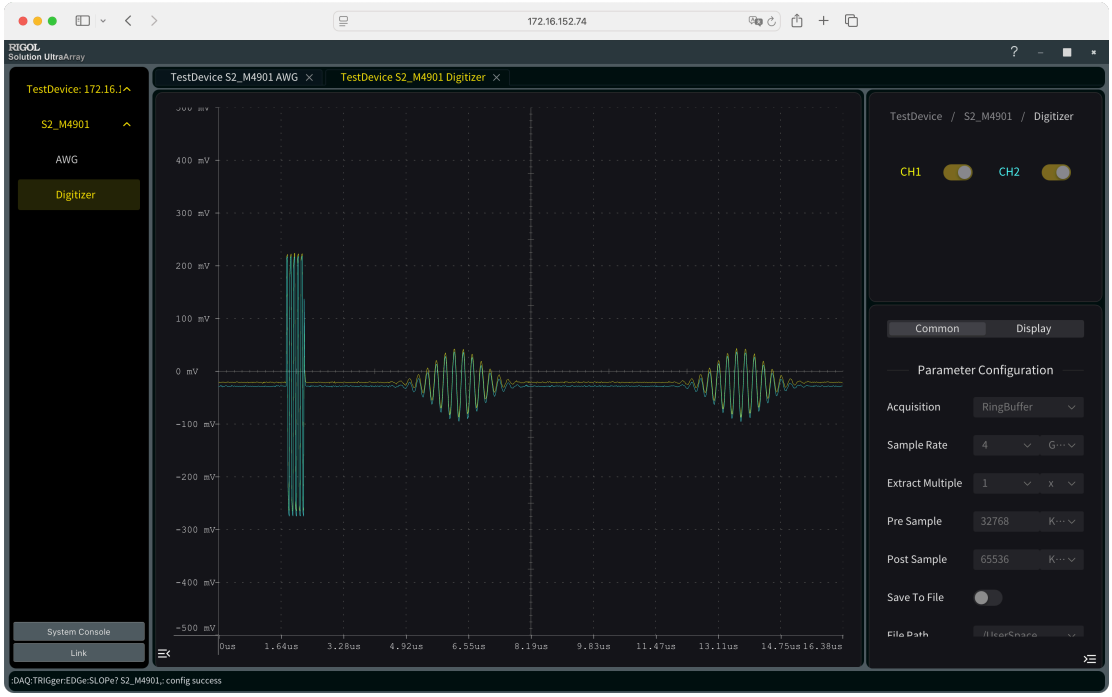


13. Click the Trigger Source drop-down button to select Level. Set the Trigger Level as 0.2 V, and click the Sync button to wait for the system synchronization configuration to be completed.

14. Click the Start button to simultaneously start the AWG transmission and Digitizer reception tasks for all enabled channels.

    Click Digitizer to enter the Digitizer interface and observe the captured waveforms updating in real time (as shown in the figure below).



15. Currently, the first loop-back experiment has been completed.

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7 Basic Operation

7.1 To Use the Built-in Help System

The built-in help system provides instructions for all the front-panel keys and their corresponding menu keys. Click to access the Help menu. You can also access to the company official website to acquire the online help documentation.

7.2 Power-on Test

You can refer to the Power-on Test chapter in *SUA8000 User Guide*.

7.3 Remote Control

Users can program and control the instrument by using the SCPI (Standard Commands for Programmable Instruments) commands. For details about the SCPI commands and programming, refer to Programming Guide of this product series.

The following two ways of remote control are supported:

- **User-defined Programming**

  Users can program and control the instrument by using the SCPI (Standard Commands for Programmable Instruments) commands. For details about the SCPI commands and programming, refer to Programming Guide of this product series.

- **Web Control**

  The instrument supports remote control via a web browser. Connect the instrument to the network and obtain the device IP address from the front panel display of the device. Input the IP address into the address bar of the browser of your computer to realize remote control of the instrument.

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8 More Product Information

1. Obtain the Device Information

   Select a device and then click System Console to obtain the information of the instrument, such as the model, serial number and firmware version number.

2. View the Option Information and Install the Option

   Select a device and click License in the System Console, and you can obtain the installation status of the option.

   For more information about the instrument, refer to the relevant manuals by logging in to the official website of RIGOL (http://www.rigol.com) to download them.

- *SUA8000 User Guide* introduces the functions of the instrument and the operation methods, remote control methods, possible failures and solutions in using the instrument, specifications, and order information.
- *SUA8000 Programming Guide* provides detailed descriptions of SCPI commands and programming examples of the instrument.
- *SUA8000 Data Sheet* provides the key features and technical specifications of the instrument.

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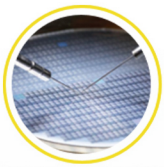

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