OWON SDS210S

OWON SDS210S Digital Oscilloscope User Manual

Model: SDS210S

1. Introduction

This manual provides detailed instructions for the safe and effective operation of your OWON SDS210S Digital Oscilloscope. Please read this manual thoroughly before using the instrument and keep it for future reference.

2. Safety Information

To prevent electric shock or personal injury, and to avoid damage to the instrument or connected equipment, observe the following safety precautions:

- Use the provided power cord.
- Connect and disconnect probes properly.
- Do not operate in wet or damp conditions.
- Do not operate in explosive atmospheres.
- Keep product surfaces clean and dry.
- Refer servicing to qualified personnel.

3. Package Contents

Verify that all items listed below are included in your package. If any items are missing or damaged, please contact your supplier.

- OWON SDS210S Digital Oscilloscope
- Power Cord
- USB Cable
- Oscilloscope Probes (2)
- BNC Cable
- Quick Guide / User Manual



Figure 3.1: OWON SDS210S Digital Oscilloscope with its standard accessories, including power cord, USB cable, probes, BNC cable, and quick guide.

4. Product Overview

4.1 Front Panel Layout

The front panel of the SDS210S features the display, control knobs, buttons, and input/output ports. Familiarize yourself with these components for efficient operation.

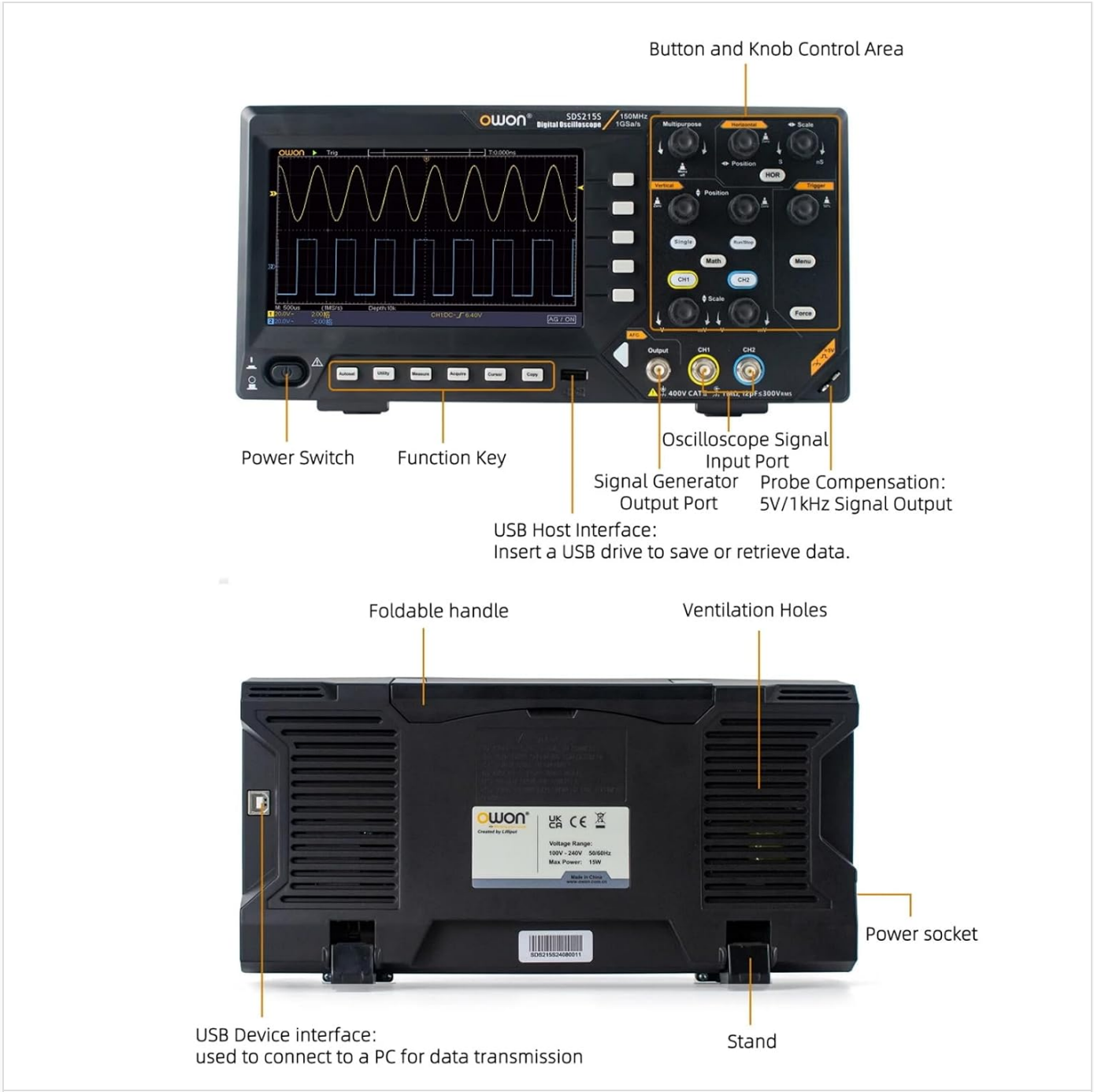


Figure 4.1: Detailed diagram showing the front panel controls and rear panel connections of the OWON SDS210S Digital Oscilloscope.

- **7-inch TFT LCD Display:** Provides clear visualization of waveforms and measurement data.
- **Button and Knob Control Area:** Dedicated controls for various oscilloscope functions, including vertical, horizontal, trigger, and menu navigation.
- **Oscilloscope Signal Input Ports (CH1, CH2):** BNC connectors for connecting probes to measure signals.
- **Signal Generator Output Port:** BNC connector for outputting arbitrary waveforms.
- **USB Host Interface:** For connecting USB storage devices to save or retrieve data.
- **Probe Compensation Output:** Provides a 5V/1kHz signal for probe calibration.

4.2 Rear Panel Layout

The rear panel includes essential connections for power and PC communication.

- **Power Socket:** For connecting the power cord.
- **USB Device Interface:** Used to connect the oscilloscope to a PC for data transmission and remote control.
- **Ventilation Holes:** Ensure proper airflow to prevent overheating.

- **Foldable Handle:** For portability and convenient positioning.

4.3 Key Features

- Dual-channel Oscilloscope with 100MHz Bandwidth and 1GS/s sampling rate.
- Integrated 25MHz Arbitrary Waveform Signal Generator.
- FFT Spectrum Analysis for frequency domain signal analysis.
- 30 Automatic Waveform Measurements, including time, amplitude, and phase values.
- 6-digit High-precision Frequency Counter.
- USB Device interface for PC communication, supporting SCPI and LabVIEW functions for remote control and secondary development.



Figure 4.2: Overview of the SDS210S's core capabilities, including 100MHz bandwidth, 1GS/s sampling rate, 20M record length, and 30 automatic measurements.

5. Setup

5.1 Power Connection

1. Ensure the power switch on the front panel is in the OFF position.
2. Connect the provided power cord to the power socket on the rear panel of the oscilloscope.
3. Plug the other end of the power cord into a grounded AC power outlet.

5.2 Probe Connection and Compensation

1. Connect the oscilloscope probe to one of the input channels (CH1 or CH2) on the front panel.
2. Attach the probe tip to the Probe Compensation Output (5V/1kHz) on the front panel.
3. Power on the oscilloscope.
4. Adjust the probe compensation on the probe itself until a flat-top square wave is displayed on the screen. This ensures accurate measurements.

6. Operating Instructions

6.1 Basic Operation

1. **Power On/Off:** Press the power switch on the front panel to turn the instrument on or off.
2. **Channel Selection:** Use the CH1 and CH2 buttons to enable or disable input channels.
3. **Vertical Scale (VOLTS/DIV):** Adjust the vertical scale knob to change the voltage per division.
4. **Horizontal Scale (SEC/DIV):** Adjust the horizontal scale knob to change the time per division.
5. **Trigger Level:** Use the Trigger knob to set the trigger level for stable waveform display.

6.2 Waveform Display and Zoom

The 7-inch TFT LCD display allows for clear viewing and detailed analysis of waveforms, including a zoom function.

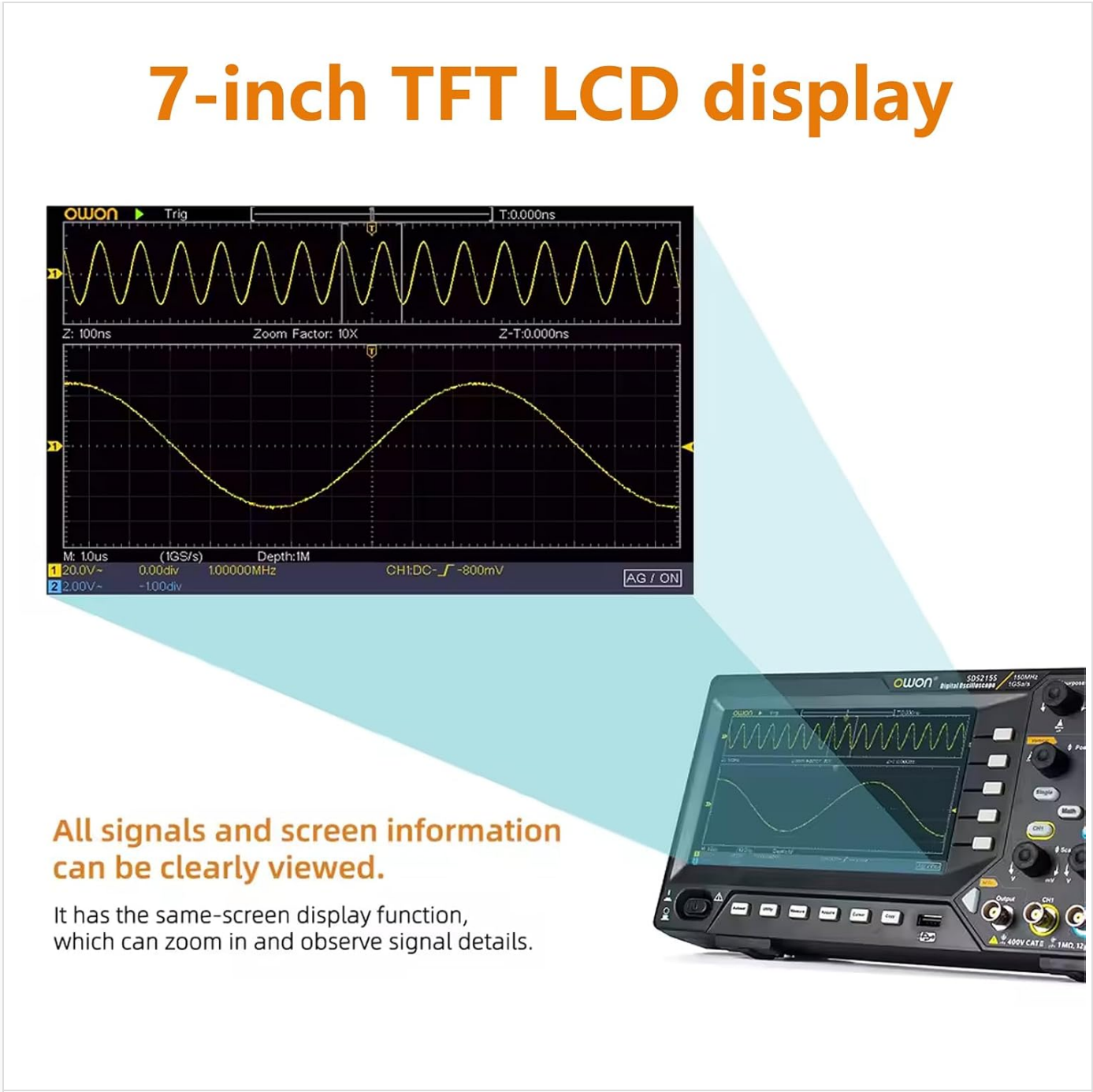


Figure 6.1: The 7-inch TFT LCD display demonstrating the zoom function for detailed signal observation.

6.3 Signal Generator Function

The SDS210S includes a 25MHz arbitrary waveform generator. To use this function:

1. Connect a BNC cable from the Signal Generator Output port to your desired load.
2. Press the "Output" button or navigate through the menu to access the signal generator settings.
3. Select the desired waveform type (e.g., sine, square, ramp, arbitrary).
4. Adjust parameters such as frequency, amplitude, and offset using the corresponding controls.



Figure 6.2: Close-up view of the 25MHz Arbitrary Waveform Generator output port on the SDS210S.

6.4 FFT Spectrum Analysis

The Fast Fourier Transform (FFT) function allows you to analyze signals in the frequency domain, useful for identifying harmonics, distortion, and noise.

- Press the "Math" button and select FFT from the menu.
- Adjust the FFT settings, such as window type and source channel, to optimize the spectrum display.

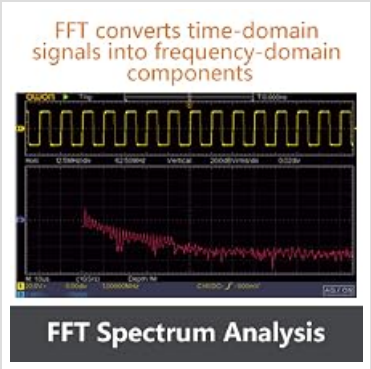


Figure 6.3: Example of FFT spectrum analysis displayed on the oscilloscope screen, converting time-domain signals into frequency components.

6.5 Automatic Waveform Measurements

The SDS210S supports 30 types of automatic measurements, simplifying signal analysis.

- Press the "Measure" button to display the automatic measurement menu.
- Select the desired measurements (e.g., Period, Frequency, Vpp, RMS) to be displayed on the screen.



Figure 6.4: Screen showing various automatic waveform measurements, including time, count, delay, phase, and amplitude values.

6.6 PC Communication and Remote Control

The USB Device interface allows connection to a PC for remote control and data transfer, supporting SCPI commands and LabVIEW functions.



Figure 6.5: The SDS210S connected to a computer, illustrating its capability for remote control and secondary development via USB.

7. Maintenance

7.1 General Care

- **Cleaning:** Clean the instrument's exterior with a soft, damp cloth. Do not use abrasive cleaners or solvents.
- **Storage:** Store the oscilloscope in a dry, dust-free environment when not in use.
- **Ventilation:** Ensure ventilation holes are clear of obstructions to prevent overheating.

7.2 Calibration

Periodic calibration by qualified personnel is recommended to maintain measurement accuracy.

8. Troubleshooting

This section addresses common issues you might encounter. For problems not listed here, please contact customer support.

- **No Power:** Check the power cord connection and the power outlet. Ensure the power switch is ON.
- **No Waveform Display:** Verify probe connections, channel selection, and vertical/horizontal scale settings. Adjust the trigger level.
- **Unstable Waveform:** Adjust the trigger source, type, and level. Check probe compensation.
- **Incorrect Measurements:** Perform probe compensation. Ensure correct measurement settings are selected.

9. Specifications

The following table provides detailed technical specifications for the OWON SDS210S Digital Oscilloscope.

Feature	Specification (SDS210S)
Model	SDS210S
Access Channels	2CH
Bandwidth	100MHz
Sampling Rate	1GS/s
Storage Depth	20M
Vertical Resolution	8 bit
Signal Generator	1CH (25MHz Arbitrary Waveform)
Package Dimensions	14.57 x 7.09 x 4.53 inches
Item Weight	3.53 Pounds
Manufacturer	OWON

SDS200 series-Selection Table

All models are sold in this shop

Models	SDS210S	SDS215S	SDS220S
Access	2CH	2CH	2CH
Bandwidth	100MHz	150MHz	200MHz
Sampling rate	1GSa/S	1GSa/S	1GSa/S
Storage depth	20M	20M	20M
Vertical Resolution	8 bit	8 bit	8 bit
Signal generator	1CH	1CH	1CH

Figure 9.1: SDS200 series selection table, showing specifications for SDS210S, SDS215S, and SDS220S models.

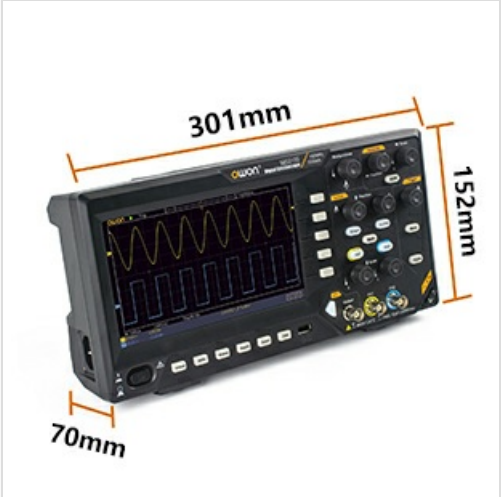


Figure 9.2: Physical dimensions of the OWON SDS210S: 301mm (length) x 152mm (height) x 70mm (depth).

10. Warranty and Support

OWON products are designed for reliability and performance. For warranty information and technical support, please refer to the official OWON website or contact your local distributor. Keep your purchase receipt as proof of purchase.
Manufacturer: OWON
Date First Available: December 16, 2024

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Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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