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OWON ADS804A

OWON ADS804A Digital Oscilloscope

USER MANUAL

1. Introduction

Thank you for choosing the OWON ADS804A Digital Oscilloscope. This device is a high-performance, 4-channel, 70MHz bandwidth oscilloscope featuring a 1.25 GSa/s real-time sample rate, 12-bit vertical resolution, and a 7-inch multi-touch display. It integrates multiple functions including an oscilloscope, frequency counter, voltmeter, and FFT spectrum analyzer, making it suitable for a wide range of applications from circuit debugging to automotive electronics testing. This manual provides essential information for the safe and efficient operation of your device.

2. Safety Information

Please read the following safety precautions carefully to avoid personal injury and prevent damage to this product or any products connected to it. Use this product only as specified. Failure to observe these precautions could result in serious injury or death.

- **Ground the Product:** This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground.
- **Connect and Disconnect Properly:** Connect the probe output to the measurement circuit before connecting the probe to the oscilloscope. Disconnect the probe from the oscilloscope before disconnecting it from the measurement circuit.
- **Observe All Terminal Ratings:** To avoid fire or shock hazard, observe all ratings and markings on the product. Refer to the product manual for more information about ratings before connecting to the instrument.
- **Do Not Operate in Wet/Damp Conditions:** Do not operate the instrument in a wet or damp environment.
- **Do Not Operate in Explosive Atmosphere:** Do not operate the instrument in an explosive atmosphere.
- **Keep Product Surfaces Clean and Dry:** Keep the instrument's surfaces clean and dry to prevent contamination.

3. Package Contents

Please check the contents of your package upon receipt. If any items are missing or damaged, contact your dealer immediately.

- OWON ADS804A Digital Oscilloscope Unit
- Passive Probes (Quantity: 4)
- Power Adapter and Cord

- USB Cable
- Quick Guide / User Manual (this document)

4. Product Overview

4.1. Multifunctional Capabilities

The ADS804A is a versatile instrument designed for various professional applications, including automotive diagnostics, audio testing, circuit analysis, and educational purposes. It integrates several measurement tools into one compact device.

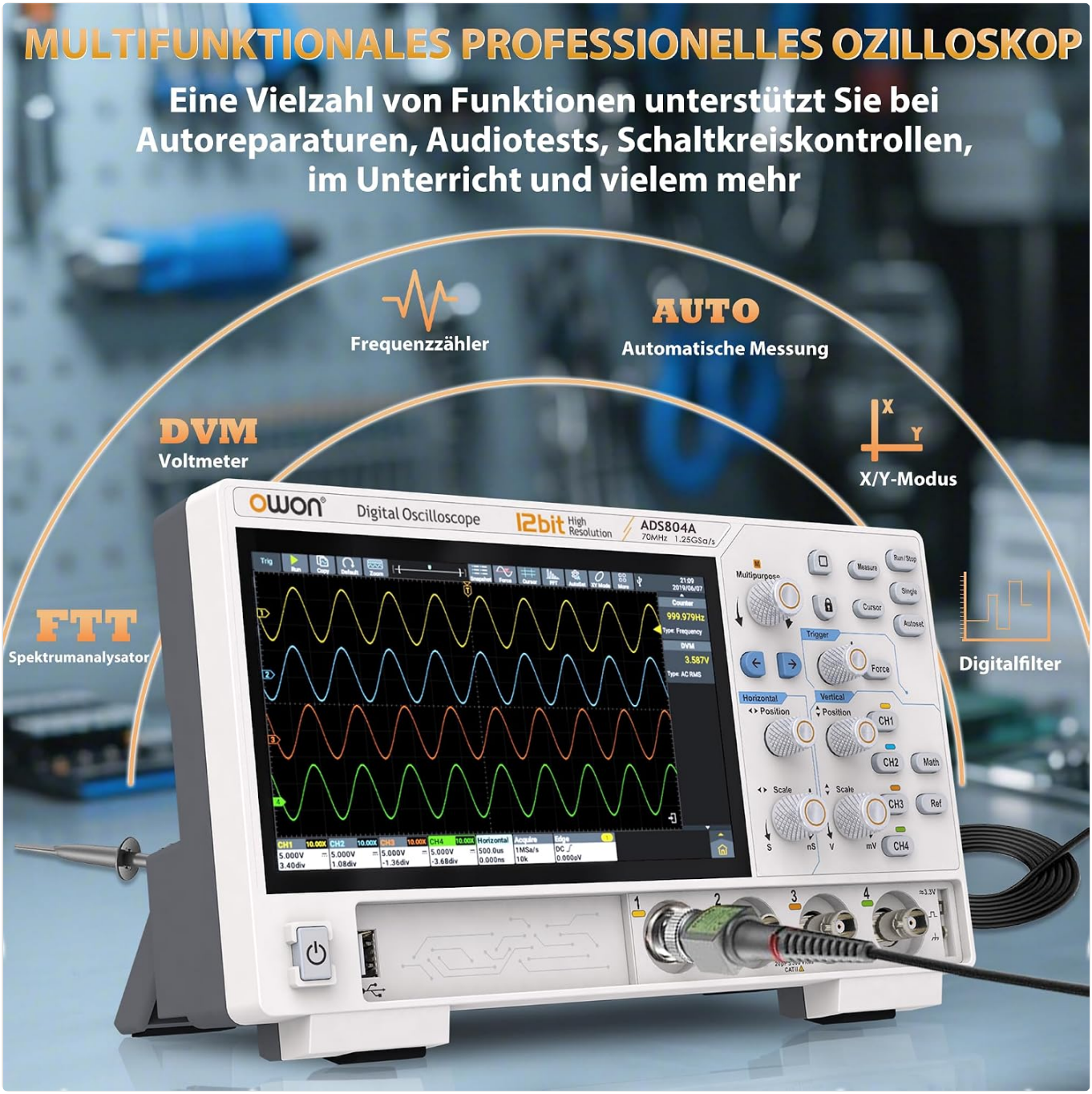


Figure 4.1: The OWON ADS804A showcasing its multifunctional capabilities, including Frequency Counter, Voltmeter, Spectrum Analyzer, Automatic Measurement, X/Y Mode, and Digital Filter.

4.2. High-Resolution Display and Performance

The oscilloscope features a 12-bit vertical resolution, allowing for precise detection of minute signal fluctuations. Its 7-inch TFT-LCD multi-touch display provides a high-resolution view of waveforms with clear details and supports user-

defined menus for enhanced usability.



Figure 4.2: Front view of the OWON ADS804A, highlighting its 12-bit resolution, 4 channels, 1.25 GSa/s sample rate, 70 MHz bandwidth, and 700,000 wfms/s waveform refresh rate.



Figure 4.3: The 7-inch LCD TFT multi-touch control screen of the ADS804A, offering a high-resolution display for clear waveform details and supporting capacitive multi-touch interactions.

4.3. Front Panel Controls

The front panel provides access to all primary controls and input channels:

- **Display:** 7-inch multi-touch TFT-LCD screen.
- **Channel Inputs (CH1-CH4):** BNC connectors for probe connections.
- **Horizontal Controls:** Adjust waveform time base (Scale) and position.
- **Vertical Controls:** Adjust voltage scale (Scale) and vertical position for each channel.
- **Trigger Controls:** Set trigger level, mode, and type.
- **Multipurpose Knob:** Used for menu navigation and parameter adjustment.
- **Function Buttons:** Include Measure, Single, Cursor, Autoset, Run/Stop, Math, Ref, and channel selection buttons.
- **Power Button:** Turns the device on or off.

4.4. Rear Panel Interfaces

The rear panel offers various connectivity options for external devices and power:

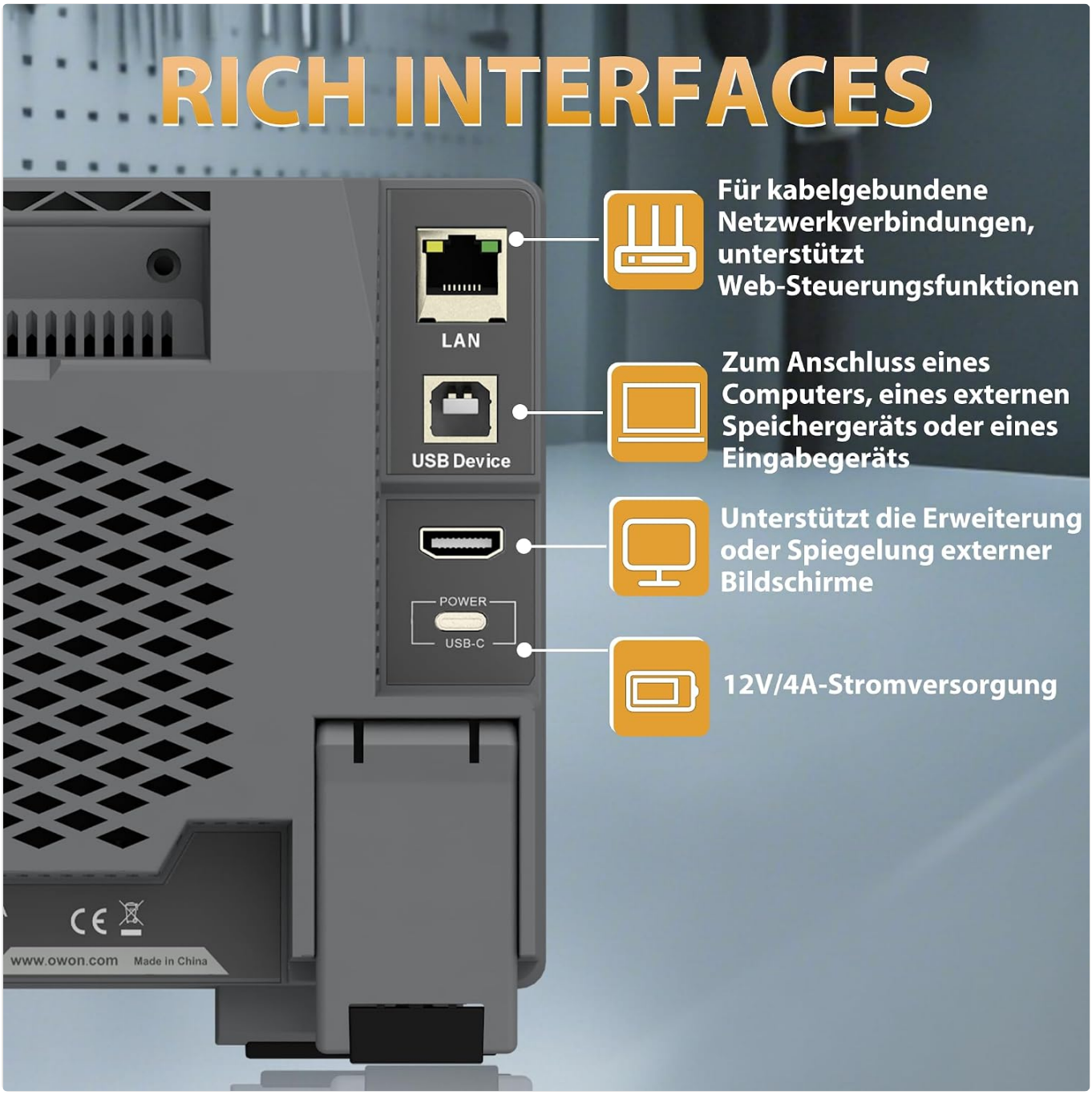


Figure 4.4: The rear panel of the ADS804A, detailing its rich interfaces for connectivity.

- **LAN Port:** For wired network connections and web control functions.
- **USB Device Port:** For connecting to a computer.
- **USB Host Port:** For connecting external storage devices (e.g., USB flash drive), keyboard, or mouse.
- **HDMI Port:** Supports extension or mirroring to external displays.
- **USB Type-C Power Input:** 12V/4A power supply connection.
- **Trig Out (P/F):** Trigger output port.
- **Security Lock Hole:** For physical security.
- **Grounding Terminal:** For additional grounding connection.



Figure 4.5: Overview of the OWON ADS804A, showing both front and rear panels with key features and dimensions.

5. Setup

5.1. Powering On the Device

1. Connect the provided power adapter to the USB Type-C power input on the rear panel of the oscilloscope.
2. Plug the power adapter into a suitable AC power outlet.
3. Press the power button located on the front panel. The device will boot up and display the OWON logo, followed by the main waveform display.

5.2. Connecting Probes

1. Ensure the oscilloscope is powered off before connecting probes.
2. Connect the BNC connector of a passive probe to one of the input channels (CH1-CH4) on the front panel.
3. Attach the probe's ground clip to the ground terminal of the circuit under test.
4. Connect the probe tip to the test point in your circuit.

5. Power on the oscilloscope.

5.3. Initial Configuration

Upon first use, or after a factory reset, you may need to perform a self-calibration for optimal accuracy. Refer to the on-screen menu for calibration options, typically found under the Utility or System settings.

6. Operating Instructions

6.1. Basic Waveform Display

1. **Power On:** Turn on the oscilloscope.
2. **Connect Signal:** Connect a probe to CH1 and attach it to a known signal source (e.g., a function generator).
3. **Autoset:** Press the **Autoset** button. The oscilloscope will automatically adjust vertical, horizontal, and trigger settings to display a stable waveform.
4. **Adjust Vertical Scale/Position:** Use the vertical scale (V/div) and position knobs for CH1 to adjust the waveform's amplitude and vertical placement on the screen.
5. **Adjust Horizontal Scale/Position:** Use the horizontal scale (s/div) and position knobs to adjust the waveform's time base and horizontal placement.

6.2. Triggering

Triggering stabilizes repetitive waveforms and captures single-shot events. The ADS804A offers extensive trigger options:

- **Edge Trigger:** Triggers on a rising or falling edge of a signal.
- **Video Trigger:** Triggers on specific video line or field.
- **Pulse Width Trigger:** Triggers on pulses of a specified width.
- **Rise/Fall Time Trigger:** Triggers on signals with a specific rise or fall time.
- **Nth Edge Trigger:** Triggers on the Nth edge of a signal.
- **Logic Trigger:** Triggers based on logical combinations of multiple input channels.

Access trigger settings via the **Trigger** menu on the display.

6.3. Measurements

The oscilloscope supports 43 types of automatic measurements and manual cursor measurements.

- **Automatic Measurements:** Press the **Measure** button to access a menu of automatic measurements (e.g., Vpp, Vmax, Vmin, Freq, Period, Rise Time, Fall Time). Select the desired measurements to display them on screen.
- **Cursor Measurements:** Press the **Cursor** button to activate cursors. Use the multipurpose knob to position voltage (horizontal) and time (vertical) cursors to manually measure waveform parameters.

6.4. Advanced Functions

- **FFT Spectrum Analyzer:** Converts time-domain signals into the frequency domain. Access via the **Math** menu. Useful for analyzing signal harmonics and noise.
- **Frequency Counter:** Provides a precise digital readout of the signal frequency.
- **Digital Voltmeter (DVM):** Measures AC/DC voltage, RMS, and peak-to-peak values.
- **Math Functions:** Perform operations like Add, Subtract, Multiply, Divide, FFT, and user-defined functions on waveforms.
- **X-Y Mode:** Displays the relationship between two input signals, useful for phase comparisons or Lissajous figures.

6.5. Interface Usage

- **USB Host:** Connect a USB flash drive to save waveform data, screenshots, or update firmware. A USB keyboard/mouse can also be connected for easier operation.
- **USB Device:** Connect the oscilloscope to a PC for remote control and data transfer using OWON's PC software.
- **LAN:** Connect to a network for remote control via web browser or dedicated software.
- **HDMI:** Connect an external monitor to view the oscilloscope display on a larger screen.

7. Maintenance

7.1. Cleaning the Device

To clean the exterior of the instrument, use a soft cloth dampened with mild detergent and water. Do not use abrasive cleaners or solvents. Ensure the device is powered off and unplugged before cleaning. Avoid getting moisture into any openings.

7.2. Probe Care

Handle probes carefully. Avoid bending the probe tips excessively. Store probes in a clean, dry place when not in use. Periodically check probe cables for damage.

7.3. Firmware Updates

OWON may release firmware updates to improve performance or add new features. Check the official OWON website for the latest firmware and instructions on how to update your device.

8. Troubleshooting

Problem	Possible Cause	Solution
Device does not power on	Power cable not connected; Power adapter faulty; Device fault.	Check power cable connection; Try another power outlet/adapter; Contact support.
No waveform displayed	Probe not connected; Signal source off; Vertical/Horizontal scale incorrect; Trigger level incorrect.	Check probe connection; Verify signal source; Press **Autoset**; Adjust vertical/horizontal scales; Adjust trigger level.
Waveform is unstable/rolling	Trigger settings incorrect; Signal noise.	Adjust trigger level and mode; Ensure trigger source is correct; Use averaging or filtering functions.
Distorted waveform	Probe compensation incorrect; Input signal too large/small; Bandwidth limit enabled.	Compensate probe; Adjust vertical scale; Disable bandwidth limit if active.
Touchscreen unresponsive	Temporary software glitch; Screen calibration issue.	Restart the device; Perform screen calibration (if available in settings).

9. Specifications

Parameter	Specification
Bandwidth	70 MHz
Channels	4 Analog Channels

Parameter	Specification
Real-time Sample Rate	1.25 GSa/s
Memory Depth	50 Mpts
Waveform Refresh Rate	Up to 700,000 wfms/s
Vertical Resolution	12-bit
Vertical Sensitivity	500 µV/div to 10 V/div
Display	7-inch TFT-LCD Multi-touch Screen
Interfaces	HDMI, USB Device, USB Host, LAN, Trigger Out (P/F)
Power Supply	12V/4A (USB Type-C)
Dimensions (L x W x H)	26.04 x 17.02 x 16 cm (10.25 x 6.70 x 6.30 inches)
Weight	1.5 kg (3.3 lbs)

10. Warranty and Support

OWON products are designed and manufactured to the highest quality standards. For warranty information, please refer to the warranty card included with your purchase or visit the official OWON website. For technical support, product updates, or service inquiries, please contact your local distributor or visit the OWON official support page.

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