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OWON HDS2202S

OWON HDS2202S 3-in-1 Handheld Oscilloscope User Manual

Model: HDS2202S

1. Introduction

The OWON HDS2202S is a versatile 3-in-1 handheld device integrating a digital oscilloscope, a true-RMS multimeter, and a waveform signal generator. Designed for portability and efficiency, it is suitable for various applications including circuit testing, field service, laboratory work, and educational purposes.
This manual provides essential information for the safe and effective operation of your HDS2202S device. Please read it thoroughly before use and keep it for future reference.

2. Key Features

- **3-in-1 Functionality:** Combines Oscilloscope, Multimeter, and Signal Generator.
- **Oscilloscope:** 200 MHz Bandwidth, 1 GS/s Sample Rate, 2 Channels.
- **Multimeter:** 20,000 Counts True-RMS, measures Voltage, Current, Resistance, Capacitance, Diode, and Continuity.
- **Signal Generator:** Up to 25 MHz Sine, 5 MHz Square/Pulse, 1 MHz Ramp waveforms.
- **Display:** 3.5-inch high-contrast color LCD with adjustable brightness.
- **Connectivity:** USB Type-C interface for PC connection and data transfer.
- **Power:** Built-in 18650 lithium battery, easily replaceable, providing 3-6 hours of operation.
- **Advanced Features:** Supports SCPI communication, self-calibration, Edge Trigger, Peak Detect, Auto Measure, Cursor Measure.

3. Safety Information

Always adhere to the following safety precautions to prevent personal injury and damage to the instrument:

- Do not exceed the maximum input ratings for any function.
- Ensure probes and test leads are in good condition and properly connected before making measurements.
- Avoid operating the device in wet or damp environments.

- Do not operate the device if it appears damaged or is not functioning correctly.
- Refer to the CAT ratings for safe measurement categories. The device is rated CAT II 600V and CAT I 1000V.
- Use only the specified battery type and charger.

4. Package Contents

Verify that all items listed below are included in your package:



Image: Included accessories for the OWON HDS2202S, showing standard oscilloscope probes, multimeter probes, USB cable, power adapter, and a user manual.

- OWON HDS2202S Handheld Oscilloscope Unit
- Standard Oscilloscope Probe (x1)
- Multimeter Probe (x1 set)
- Crocodile Clip Probe (x2)
- USB Type-C Cable (x1)

- Power Adapter (x1)
- User Manual
- Optional: Additional P2200 Probe, Auxiliary Accessory Package, Q9 Cable

5. Device Overview

Familiarize yourself with the device's front panel, display, and connection ports.



Image: Front view of the OWON HDS2202S, highlighting the display, function buttons (F1-F4), navigation keys, and input terminals for oscilloscope, multimeter, and signal generator.

5.1 Front Panel Controls

- **Function Buttons (F1-F4):** Context-sensitive buttons for menu navigation and settings.
- **Navigation Keys:** Up, Down, Left, Right, and OK for menu selection and parameter adjustment.
- **Mode:** Switches between Oscilloscope, Multimeter, and Signal Generator modes.
- **System:** Accesses system settings and utilities.
- **Save:** Saves waveforms or measurement data.
- **Auto:** Automatic setup for oscilloscope measurements.
- **Trig/Δ:** Trigger settings or delta measurement.
- **CH1/2:** Selects oscilloscope channel 1 or 2.
- **HOR:** Horizontal scale/position adjustment.
- **Measure Range:** Adjusts measurement range in multimeter mode.
- **Power Button:** Turns the device on/off.

5.2 Input/Output Terminals

- **CH1/CH2:** Oscilloscope input channels.

- **GEN OUT:** Signal generator output.
- **A, mA, COM, VΩ+C:** Multimeter input terminals.
- **USB-C Port:** For charging and PC connectivity.

6. Setup

6.1 Battery Installation and Charging

The HDS2202S uses a built-in 18650 lithium battery. Ensure the battery is charged before first use.

1. Connect the provided USB Type-C cable to the device's USB-C port.
2. Connect the other end of the USB cable to the power adapter and plug it into a power outlet.
3. The charging indicator on the device will show charging status. A full charge typically takes several hours.

6.2 Initial Power On

1. Press and hold the Power button until the OWON logo appears on the screen.
2. The device will boot into the last used mode (Oscilloscope, Multimeter, or Signal Generator).
3. Adjust the display brightness if necessary using the system settings.

7. Operating Instructions

7.1 Oscilloscope Mode

The oscilloscope function allows for detailed waveform analysis with a 200 MHz bandwidth and 1 GS/s sample rate.



Image: The oscilloscope display showing dynamic signal observation with 10,000 wfms/s, illustrating how to detect transient disturbances and analyze ripple.

1. Press the **Mode** button to select Oscilloscope mode.
2. Connect the oscilloscope probe to the CH1 or CH2 input.
3. Connect the probe to the circuit under test.
4. Press the **Auto** button for automatic waveform setup, or manually adjust vertical (VOLTS/DIV) and horizontal (TIME/DIV) scales using the navigation keys.
5. Use the **Trig/Δ** button to adjust trigger settings (e.g., Edge, Level) for stable waveform display.
6. Utilize the F1-F4 buttons for additional functions like cursor measurements, automatic measurements, and waveform saving.

7.2 Multimeter Mode

The multimeter function provides precise measurements of various electrical parameters.



Image: The multimeter display showing a voltage reading, along with icons representing various measurement functions like voltage, current, resistance, capacitance, diode, and continuity.

1. Press the **Mode** button to select Multimeter mode.
2. Connect the multimeter probes to the appropriate input terminals (VΩ+C, COM, A, or mA).
3. Use the F1-F4 buttons or navigation keys to select the desired measurement function (Voltage, Current, Resistance, Capacitance, Diode, Continuity).
4. Connect the probes to the circuit or component to be measured. The reading will be displayed on the screen.
5. The multimeter features **Auto Range** for convenience, but manual range selection is also available via the **Measure Range** button.

7.3 Signal Generator Mode

The signal generator produces various waveforms for testing circuits.



Image: The signal generator interface showing settings for frequency, amplitude, offset, and waveform type (Sine, Square, Ramp, Pulse, Arbitrary). It also illustrates connecting the GEN OUT to a circuit for testing.

1. Press the **Mode** button to select Signal Generator mode.
2. Connect a BNC cable from the **GEN OUT** port to the circuit or device you wish to test.
3. Use the F1-F4 buttons and navigation keys to set the desired waveform type (Sine, Square, Ramp, Pulse, Arbitrary), frequency (up to 25 MHz for Sine), amplitude, and offset.
4. Turn the output ON/OFF as needed.

7.4 PC Connectivity and SCPI

The HDS2202S can connect to a PC for data transfer, software control, and secondary development using SCPI commands.



Image: The OWON HDS2202S connected via USB-C to a laptop, demonstrating PC software for waveform display and data storage, and highlighting SCPI support for control and development.

1. Connect the device to your PC using the provided USB Type-C cable.
2. Install the OWON PC software (available from the manufacturer's website).
3. Follow the software instructions to view waveforms, save data, and control the device remotely.
4. For advanced users, refer to the SCPI programming guide for command-line control and integration into custom applications.

8. Applications

The OWON HDS2202S is suitable for a wide range of professional and educational applications.

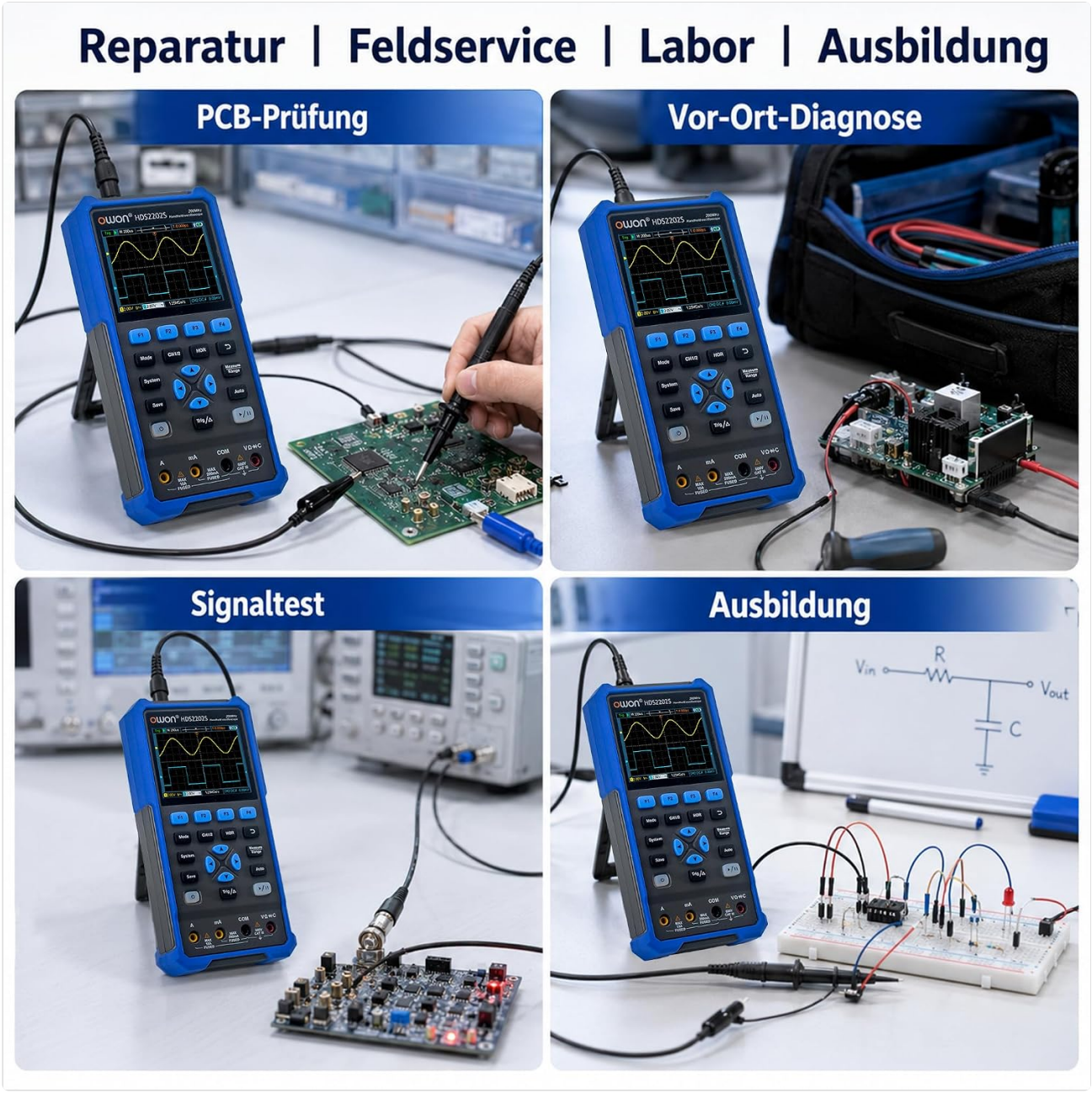


Image: Four scenarios demonstrating the HDS2202S in use: PCB testing, field service diagnosis, signal testing in a lab, and educational training.

- **Repair and Maintenance:** Diagnosing and troubleshooting electronic circuits and systems.
- **Field Service:** Portable testing and analysis for on-site repairs and installations.
- **Laboratory Work:** General-purpose testing and measurement in R&D and academic labs.
- **Education and Training:** Ideal for teaching fundamental electronics and measurement principles.

9. Maintenance

9.1 Cleaning

To clean the device, use a soft cloth dampened with mild detergent. Do not use abrasive cleaners or solvents. Ensure the device is powered off and disconnected from all power sources and circuits before cleaning.

9.2 Battery Care

For optimal battery life, charge the device regularly. If storing the device for an extended period, ensure the battery

is charged to approximately 50% and recharge it every few months.

9.3 Calibration

The device supports a self-calibration function. Refer to the system menu for instructions on performing self-calibration to maintain measurement accuracy.

10. Troubleshooting

If you encounter issues with your HDS2202S, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Device does not power on.	Low or depleted battery.	Connect the device to the power adapter and charge the battery.
No waveform displayed in oscilloscope mode.	Probe not connected, incorrect trigger settings, or signal too small/large.	Check probe connection. Press **Auto**. Adjust vertical/horizontal scales and trigger level.
Multimeter readings are inaccurate.	Incorrect function selected, poor probe contact, or device needs calibration.	Verify function selection. Ensure good probe contact. Perform self-calibration.
Signal generator output is not as expected.	Incorrect waveform parameters (frequency, amplitude, offset) or output OFF.	Check and adjust waveform parameters. Ensure output is turned ON.
PC software cannot connect to the device.	USB cable issue, driver not installed, or incorrect software settings.	Ensure USB cable is properly connected. Install necessary drivers. Check software connection settings.

11. Specifications

Detailed technical specifications for the OWON HDS2202S.

Parameter	Specification
Model	HDS2202S
Manufacturer	OWON
Oscilloscope Bandwidth	200 MHz
Oscilloscope Sample Rate	1 GS/s
Oscilloscope Channels	2
Multimeter Counts	20,000
Signal Generator Frequency (Sine)	Up to 25 MHz
Display	3.5-inch Color LCD

Parameter	Specification
Dimensions	10 x 4 x 20 cm
Weight	600 g
Battery Type	18650 Lithium Ion (1 AAA required, included)
Power Source	Battery Powered
Connectivity	USB Type-C
Safety Rating	CE, CAT II 600V, CAT I 1000V

12. Warranty and Support

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 for warranty claims.

- **Manufacturer:** OWON
- **Product Page:** OWON HDS2202S on Amazon.es

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