OWON MSO8102T

OWON MSO8102T Mixed Signal Oscilloscope User Manual

Model: MSO8102T

1. Introduction

The OWON MSO8102T is a versatile mixed signal oscilloscope designed for advanced electronic testing and debugging. It integrates a two-channel digital oscilloscope with a 16-channel logic analyzer, providing comprehensive capabilities for analyzing both analog and digital signals. This manual provides essential information for the safe and effective operation, setup, and maintenance of your MSO8102T device.

2. Safety Information

Please read and understand all safety instructions before operating the device. Failure to follow these instructions may result in injury or damage to the instrument.

- **Power Source:** Connect the instrument only to a properly grounded power outlet. Ensure the voltage matches the specifications listed on the device.
- **Environment:** Operate the device in a dry, well-ventilated area. Avoid exposure to moisture, extreme temperatures, or corrosive gases.
- **Probes:** Use only probes supplied or approved by OWON. Ensure probes are correctly rated for the voltage and current being measured.
- **Maintenance:** Do not attempt to service the instrument yourself. Refer all servicing to qualified personnel.
- **Grounding:** Always ensure the instrument is properly grounded to prevent electric shock.

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 MSO8102T Mixed Signal Oscilloscope Unit
- Two (2) Oscilloscope Probes (100 MHz)

- One (1) 16-Channel Logic Analyzer Probe Set
- Power Cord
- USB Cable
- User Manual (this document)
- Software CD (may be included, or available for download)



Image 3.1: Standard power cord for connecting the MSO8102T to a grounded electrical outlet.



Image 3.2: Front view of the OWON MSO8102T Mixed Signal Oscilloscope, showing the display and control panel.

4. Device Overview

The MSO8102T features an 8-inch TFT-LCD display for clear waveform visualization. The front panel includes various controls for oscilloscope and logic analyzer functions, including vertical and horizontal scale knobs, trigger controls, and function buttons.

4.1 Front Panel

The front panel houses the main display, input connectors for oscilloscope channels (CH1, CH2), the logic analyzer input port, USB host port, and a comprehensive set of buttons and rotary encoders for navigation and parameter adjustment.

4.2 Rear Panel

The rear panel typically includes the AC power input, a USB device port for PC connection, and potentially a LAN port for network connectivity (model dependent).

5. Setup

Follow these steps for initial setup of your MSO8102T.

1. **Power Connection:** Connect the supplied power cord to the AC power input on the rear panel of the instrument, then plug the other end into a grounded electrical outlet.
2. **Power On:** Press the power button located on the front panel to turn on the device. The display will illuminate, and the system will boot up.
3. **Oscilloscope Probe Connection:** Connect the oscilloscope probes to the CH1 and CH2 input BNC connectors on the front panel. Ensure a secure connection.
4. **Logic Analyzer Probe Connection:** Connect the 16-channel logic analyzer probe set to the dedicated logic analyzer input port. *Note: Some users have reported that the labeling on the logic analyzer probes may be reversed. Verify the pin assignments against the device's documentation or by testing known signals to ensure correct channel mapping.*
5. **Probe Compensation:** For accurate measurements, compensate your oscilloscope probes. Connect the probe tip to the probe compensation output (usually a square wave test point) and adjust the trimmer on the probe until a flat-top square wave is displayed on the screen.

6. Operating the Oscilloscope

The MSO8102T's digital oscilloscope features a 100 MHz bandwidth, 1 GS/s real-time sample rate per channel, and a 2 Mpts record length, enabling detailed waveform acquisition.

6.1 Basic Measurements

- **Vertical Controls:** Use the vertical position and scale knobs for each channel to adjust the vertical position and volts/division.
- **Horizontal Controls:** Use the horizontal position and scale knobs to adjust the time base (seconds/division) and horizontal position of the waveform.
- **Trigger System:** The trigger controls allow you to stabilize repetitive waveforms. Select trigger type (Edge, Pulse, Video, Slope, Alternate), source, and level.

6.2 Advanced Functions

- **Cursor Measurements:** Activate cursor measurements to precisely measure voltage (ΔV) and time (ΔT) differences between points on a waveform.
- **Math Functions:** The oscilloscope supports four math functions (Add, Subtract, Multiply, Divide) and Fast Fourier Transform (FFT) for frequency domain analysis.
- **Automatic Measurements:** Access a menu of 20 automatic measurements (e.g., Vpp, Vmax, Freq, Period) for quick analysis of waveform parameters.

7. Operating the Logic Analyzer

The integrated 16-channel logic analyzer operates at up to 200 MHz with a sample rate of 20 S/s to 1 GS/s per channel and a record length of 4 Mpts per channel, ideal for debugging embedded systems.

- **Connecting Logic Probes:** Ensure the 16-channel logic analyzer probe set is correctly connected to the device and the target circuit. Double-check channel assignments.
- **Logic Analyzer Triggering:** The logic analyzer offers advanced triggering capabilities, including triggering on slopes of individual signals, specific digital values of groups of signals (buses), and temporal sequences of digital values on buses.
- **Bus Analysis:** Configure the logic analyzer to group channels into buses for easier interpretation of digital data.

- **Display:** The 8-inch display allows for clear visualization of up to 16 digital waveforms. Note that the MSO8102T operates as a digital scope and a logic analyzer in the same box, meaning it cannot display analog and digital waveforms on the same screen simultaneously, nor does it support cross-triggering between the analog and digital sections.

8. Maintenance

Proper maintenance ensures the longevity and accuracy of your MSO8102T.

- **Cleaning:** Clean the instrument's exterior with a soft, damp cloth. Do not use abrasive cleaners or solvents. For the display, use a soft, lint-free cloth specifically designed for screens.
- **Storage:** When not in use, store the device in a clean, dry environment, away from direct sunlight and extreme temperatures.
- **Calibration:** Periodic calibration by qualified service personnel is recommended to maintain measurement accuracy.

9. Troubleshooting

This section addresses common issues you might encounter with your MSO8102T.

- **No Power:** Ensure the power cord is securely connected to both the instrument and a live, grounded outlet. Check the power button.
- **No Signal on Oscilloscope Channels:** Verify probes are correctly connected and compensated. Check input settings (e.g., AC/DC coupling, vertical scale). Ensure the signal source is active.
- **Logic Analyzer Channels Not Displaying Correctly:** Confirm the logic analyzer probe set is fully inserted and connected to the target. *As noted in Section 5, verify the labeling of the logic analyzer probes as some units may have reversed pin assignments.*
- **Unstable Waveform:** Adjust the trigger level and trigger type. Ensure the trigger source is appropriate for the signal being measured.
- **PC Software Not Working (Windows 10):** If experiencing driver or software compatibility issues, visit the official OWON website for the latest drivers and software versions. Reinstallation may be necessary.
- **Display Issues (e.g., blank screen, artifacts):** Power cycle the device. If the issue persists, contact OWON customer support.

10. Specifications

Key technical specifications for the OWON MSO8102T.

Feature	Specification
Model	MSO8102T
Oscilloscope Channels	2
Oscilloscope Bandwidth	100 MHz
Oscilloscope Sample Rate	1 GS/s (real-time per channel)
Oscilloscope Record Length	2 Mpts (per channel)
Logic Analyzer Channels	16

Feature	Specification
Logic Analyzer Bandwidth	200 MHz
Logic Analyzer Sample Rate	20 S/s to 1 GS/s (per channel)
Logic Analyzer Record Length	4 Mpts (per channel)
Display	8-inch TFT-LCD with adjustable backlight
Math Functions	Add, Subtract, Multiply, Divide, FFT
Automatic Measurements	20 types
Package Dimensions	16 x 11.4 x 7.2 inches
Item Weight	5.8 pounds

11. Warranty and Support

OWON products are designed for reliability and performance. For warranty information, technical support, or service inquiries, please refer to the warranty card included with your product or visit the official OWON website. Please have your model number (MSO8102T) and purchase details ready when contacting support.

© 2023 OWON. All rights reserved. Specifications are subject to change without notice.