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Siglent SDS1202X HD

Siglent SDS1202X HD Digital Storage Oscilloscope User Manual

Model: SDS1202X HD

1. Introduction

The Siglent SDS1202X HD is a 200MHz, 2-channel digital storage oscilloscope featuring a 12-bit high-resolution analog-to-digital converter. It incorporates Siglent's Super Phosphor Oscilloscope (SPO) technology, offering a maximum waveform capture rate of up to 120,000 wfm/s (normal mode) and 500,000 wfm/s (sequence mode). This instrument is designed for precise signal analysis with its 256-level intensity grading display and color temperature display mode.

Key features include a digital trigger system with high sensitivity and low jitter, supporting various triggering modes including serial bus triggering. Advanced tools such as History waveform recording, Search and Navigate functions, Mask Test, Bode Plot, and Power Analysis enable comprehensive waveform capture, storage, and analysis. The device also offers extensive measurement and math capabilities, with options for a 25 MHz arbitrary waveform generator and serial decoding.



Figure 1: Front view of the Siglent SDS1202X HD Digital Storage Oscilloscope, showing the display and control panel.

2. What's in the Box

Upon unpacking, verify that all items listed below are present and in good condition:

- Siglent SDS1202X HD Oscilloscope Unit
- USB Cable (Quantity: 1)
- Quick Start Guide (Quantity: 1)
- Passive Probes (Quantity: 2)
- Power Cord (Quantity: 1)

If any items are missing or damaged, please contact your vendor or Siglent Technologies customer support.

3. Setup

3.1 Power Connection

1. Ensure the oscilloscope is placed on a stable, level surface with adequate ventilation.
2. Connect the provided power cord to the AC power input on the rear panel of the oscilloscope.
3. Plug the other end of the power cord into a grounded AC power outlet.
4. Press the power button on the front panel to turn on the device.

3.2 Probe Connection and Compensation

1. Connect the passive probes to the BNC input connectors (CH1, CH2) on the front panel.
2. Attach the probe ground clip to a known ground point in your circuit.
3. For accurate measurements, probe compensation is recommended. Connect the probe tip to the probe

compensation output (usually a square wave signal) on the front panel.

4. Adjust the compensation trimmer on the probe until a flat-top square wave is displayed on the screen.



Figure 2: Front panel of the oscilloscope showing BNC input connectors and control layout.



Figure 3: Rear panel of the oscilloscope, detailing power input, USB, and LAN ports.

4. Operating Instructions

4.1 Basic Waveform Display

1. Connect a signal source to an input channel (e.g., CH1).
2. Press the **Auto Setup** button for automatic scaling and triggering.
3. Adjust the **Vertical Scale** (Volts/Div) and **Horizontal Scale** (Time/Div) knobs to optimize the waveform display.
4. Use the **Position** knobs to shift the waveform vertically or horizontally.

4.2 Trigger System

The SDS1202X HD features a versatile trigger system to stabilize waveforms. Common trigger types include Edge, Pulse, Video, Slope, and more. Access trigger settings via the **Trigger** menu button.

- **Edge Trigger:** Triggers on a rising or falling edge of a signal. Adjust the trigger level using the dedicated knob.
- **Trigger Mode:** Select between Auto, Normal, and Single modes. Auto mode triggers even without a valid trigger event, while Normal mode waits for a trigger. Single mode captures one waveform and stops.

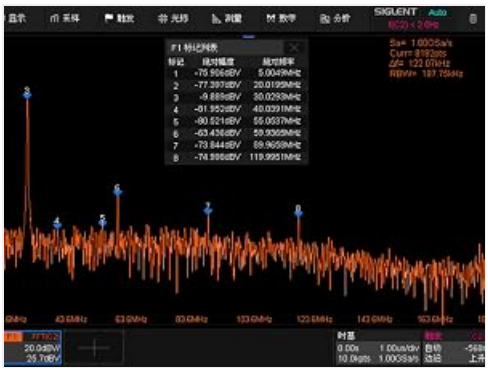


Figure 4: Display showing various trigger types available on the oscilloscope, including Edge, Pulse, and Serial.

4.3 Measurements and Analysis

The oscilloscope provides extensive measurement and analysis capabilities:

- **Automatic Measurements:** Press the **Measure** button to access a menu of automatic measurements such as frequency, period, peak-to-peak voltage, RMS, etc.
- **Cursors:** Use cursors for precise manual measurements of voltage and time differences.
- **Math Functions:** Perform waveform arithmetic (Add, Subtract, Multiply, Divide) and FFT (Fast Fourier Transform) analysis.
- **Serial Bus Decoding:** The SDS1202X HD supports decoding for various serial protocols. Access this feature through the **Decode** menu.



Figure 5: Oscilloscope display illustrating automatic peak list measurements for signal analysis.

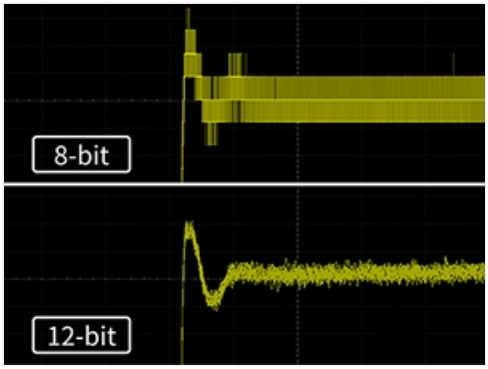


Figure 6: Example of serial bus decoding displayed on the oscilloscope screen.

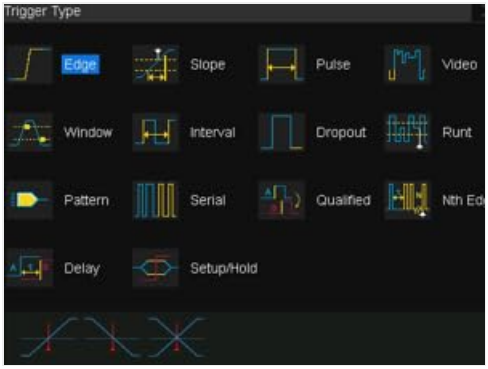


Figure 7: Example of FFT analysis showing frequency components of a signal.

4.4 Advanced Features

- **12-bit High Resolution:** The 12-bit ADC provides finer vertical resolution, allowing for more detailed observation of signal characteristics, especially for small signal variations.

- **Bode Plot:** The oscilloscope can generate Bode plots for frequency response analysis. This requires an external signal source (e.g., an arbitrary waveform generator).
- **Power Analysis:** Dedicated functions for power measurement and analysis are available.



Figure 8: Visual comparison illustrating the enhanced detail provided by 12-bit resolution compared to 8-bit.



Figure 9: Oscilloscope set up for Bode Plot analysis, showing connections to a power supply and a circuit under test.

Figure 10: Oscilloscope configured for power analysis, demonstrating connections for measuring power characteristics.

5. Maintenance

5.1 Cleaning

- Always disconnect the power cord before cleaning.
- Use a soft, damp cloth to clean the exterior of the oscilloscope. Avoid abrasive cleaners or solvents.
- For the display, use a soft, lint-free cloth specifically designed for screens.

5.2 Environmental Considerations

- Operate the oscilloscope within the specified temperature and humidity ranges.
- Avoid exposing the device to direct sunlight, excessive dust, or strong vibrations.
- Ensure proper ventilation around the unit to prevent overheating.

5.3 Calibration

The SDS1202X HD is factory calibrated. For continued accuracy, periodic calibration by qualified personnel is

recommended. Refer to Siglent's official documentation or contact support for calibration services.

6. Troubleshooting

Problem	Possible Cause	Solution
No display after power on	Power cord not connected; Power button not pressed; Power supply issue	Check power cord connection; Press power button firmly; Verify power outlet functionality
No waveform displayed	No input signal; Incorrect probe connection; Incorrect vertical/horizontal settings; Trigger not set correctly	Verify signal source; Ensure probes are connected and compensated; Adjust Volts/Div and Time/Div; Use Auto Setup or adjust trigger settings
Unstable waveform	Trigger level incorrect; Trigger source incorrect; Trigger mode unsuitable	Adjust trigger level; Select correct trigger source (e.g., CH1, CH2); Try Auto or Normal trigger mode
Measurements are inaccurate	Probe compensation incorrect; Probe attenuation setting incorrect; Device requires calibration	Perform probe compensation; Ensure probe attenuation setting matches physical probe (e.g., 10X); Contact support for calibration

For further assistance, refer to the comprehensive user manual available on the Siglent website or contact technical support.

7. Specifications

Parameter	Value
Model Number	SDS1202X HD
Bandwidth	200 MHz
Channels	2 Analog Channels
Sample Rate	2 GSa/s (Real-time)
Vertical Resolution	12-bit
Memory Depth	100 Mpts
Waveform Capture Rate	Up to 120,000 wfm/s (Normal Mode), 500,000 wfm/s (Sequence Mode)
Display	10.1" TFT-LCD, 1024 x 600 resolution, Capacitive Touch Screen
Noise Floor	As low as 70 µVrms at 200 MHz full bandwidth
Digital Channels (Optional)	16 (requires SDS1000X HD-16LA and SLA1016 logic probe, sold separately)
Product Dimensions	12.5 x 9.3 x 6 inches
Weight	12.3 Pounds
Manufacturer	Siglent Technologies

8. Warranty and Support

Siglent Technologies provides a standard warranty for the SDS1202X HD Digital Storage Oscilloscope. For detailed warranty terms and conditions, please refer to the official warranty statement included with your product or visit the Siglent Technologies website.

For technical support, service, or to inquire about additional accessories and options, please contact Siglent Technologies directly. You can find contact information and resources on their official website:

Visit the Siglent Store on Amazon

Please have your product model number (SDS1202X HD) and serial number ready when contacting support. The serial number can be found on the rear panel of the device (e.g., SDS2HBAD5R50008).

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