Hantek Hantek6074BD

Hantek 6004BD Series USB Portable Oscilloscope User Manual

Models: Hantek6074BD, Hantek6104BD, Hantek6204BD, Hantek6254BD

1. INTRODUCTION

This manual provides detailed instructions for the Hantek 6004BD Series USB Portable Oscilloscopes, including models Hantek6074BD, Hantek6104BD, Hantek6204BD, and Hantek6254BD. These devices combine a 4-channel oscilloscope with a function/arbitrary waveform generator, offering performance comparable to benchtop oscilloscopes in a portable form factor.

The 6004BD series features 4 independent analog channels, a 1GSa/s real-time sampling rate, 2mV-10V/DIV input sensitivity, and bandwidths ranging from 70MHz to 250MHz depending on the model. The integrated function/arbitrary waveform generator provides 200MSa/s DDS with 12-bit vertical resolution, supporting various standard waveforms and custom arbitrary waveforms.

Designed for portability, the device connects via USB2.0 and is compatible with Windows 7, Windows 8, and Windows 10 operating systems. Its anodized aluminum casing ensures durability and efficient heat dissipation.

2. PRODUCT OVERVIEW

2.1 Key Features

- 4-channel oscilloscope with up to 250MHz bandwidth and 1GSa/s real-time sampling.
- Integrated Function/Arbitrary Waveform Generator (DDS, 200MSa/s, 12-bit resolution).
- Pass/Fail test, resourceful trigger functions, dynamic cursor tracking, waveform record and replay.
- USB2.0 interface for plug-and-play connectivity.
- Compact and durable anodized aluminum design.
- Software support for Windows 7, 8, and 10.
- Waveform data export to EXCEL, BMP, JPG.
- Over 20 automatic measurement functions and PASS/FAIL check.
- Serial bus triggering and decode.
- Waveform averaging, afterglow, lightness control, mathematical operations (Add, Subtract, Multiply, Divide), X-Y display, FFT spectrum analyzer.
- Ability to connect multiple oscilloscopes to one computer for expanded channel count.
- Secondary development library (DLL) and examples for Labview, VB, VC.

2.2 Components and Connections

The Hantek 6004BD series oscilloscope is a compact unit designed for easy integration with a PC. Below are images illustrating the device and its included accessories.

Figure 2.2.1: Front and back view of the Hantek 6004BD Series USB Portable Oscilloscope. The front panel features four BNC input connectors for channels CH1, CH2, CH3, and CH4. The back panel includes a USB-B port for PC connection, a 5V===1A power input, a PRG (Program) button, a USBXI port, and a GEN OUT BNC connector for the waveform generator output.

Figure 2.2.2: Contents of the Hantek 6004BD Series Oscilloscope kit. This includes the main oscilloscope unit, two passive probes, two gator clip lines, a BNC to BNC cord, a USB cable, and a certification document.

Figure 2.2.3: Close-up view of the four BNC input connectors (CH1-CH4) on the Hantek 6004BD Series Oscilloscope. Each input is rated for a maximum of 35V peak-to-peak.

Figure 2.2.4: Top view of the Hantek 6004BD Series Oscilloscope, showcasing the Hantek brand logo and the robust anodized aluminum casing.

2.3 Product Video Overview

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Video 2.3.1: An official product video from the seller demonstrating the Hantek 6074BD/6104BD/6204BD/6254BD series oscilloscopes. This video provides a visual overview of the device's physical features and connections.

3. SETUP

3.1 System Requirements

- Operating System: Windows 10, Windows 8, or Windows 7.
- USB Port: Available USB2.0 port.
- Processor: Recommended Intel Core i3 or higher.
- RAM: 4GB or more recommended.
- Disk Space: At least 1GB free for software installation and data storage.

3.2 Software Installation

1. **Download Software:** Obtain the latest Hantek oscilloscope software and drivers from the official Hantek website (www.hantek.com).

2. **Install Drivers:** Run the driver installation package. Follow the on-screen prompts to complete the driver installation. It is recommended to install drivers before connecting the device.

3. **Install Application:** Run the Hantek oscilloscope application installer. Follow the instructions to install the software.

3.3 Hardware Connection

1. **Connect USB Cable:** Connect the provided USB cable from the oscilloscope's USB-B port to an available USB2.0 port on your computer.

2. **Power Connection:** The device typically draws power from the USB port. If additional power is required or if you experience unstable operation, connect a 5V===1A power adapter to the dedicated power input port (if included with your model).

3. **Probe Connection:** Connect the oscilloscope probes to the desired BNC input channels (CH1, CH2, CH3, CH4) on the front panel. Ensure a secure connection by twisting the BNC connector until it locks.

4. **Waveform Generator Output (Optional):** If using the arbitrary waveform generator, connect a BNC cable from the "GEN OUT" port on the back panel to your target circuit.

Once connected, the operating system should recognize the device, and the installed Hantek software should be able to detect and communicate with the oscilloscope.

4. OPERATING INSTRUCTIONS

4.1 Launching the Software

After successful installation and hardware connection, launch the Hantek oscilloscope application from your desktop shortcut or Start Menu. The software interface is designed to mimic a traditional benchtop oscilloscope for ease of use.

4.2 Basic Oscilloscope Functions

- **Channel Selection:** Enable or disable channels (CH1-CH4) within the software interface.
- **Vertical Scale (Volts/Div):** Adjust the vertical sensitivity for each channel to properly display the amplitude of the input signal.
- **Horizontal Scale (Time/Div):** Adjust the horizontal time base to control the time duration displayed on the screen.
- **Trigger Settings:** Configure the trigger mode (Edge, Pulse, Video, Alternative), trigger source (CH1-CH4), and trigger level to stabilize the waveform display.
- **Coupling:** Select AC, DC, or GND coupling for each channel.
- **Measurements:** Utilize the automatic measurement functions for parameters like Vpp, Vmax, Vmin, Vavg, RMS, Frequency, Period, Rise Time, Fall Time, and more.
- **Waveform Display:** Use features like waveform averaging, afterglow, lightness control, and mathematical operations (Add, Subtract, Multiply, Divide, X-Y display) to analyze signals.
- **FFT Spectrum Analyzer:** Access the built-in FFT function for frequency domain analysis.

4.3 Arbitrary Waveform Generator (AWG)

The integrated AWG allows you to generate various waveforms.

- **Waveform Selection:** Choose from standard waveforms (sine, square, triangle, etc.) or load custom arbitrary waveforms.

- **Frequency and Amplitude:** Set the desired frequency and amplitude for the generated waveform.
- **Output:** The generated waveform will be available at the "GEN OUT" BNC connector on the device's back panel.

4.4 Data Export and Analysis

The software allows for exporting waveform data and screenshots for further analysis or documentation.

- **Export Waveform Data:** Save waveform data to EXCEL format for detailed numerical analysis.
- **Export Images:** Capture screenshots of the oscilloscope display and save them as BMP or JPG files.
- **Serial Bus Decoding:** For supported serial buses, the software can decode protocol information and display it in a table format.

5. MAINTENANCE

Proper maintenance ensures the longevity and accurate performance of your Hantek oscilloscope.

- **Cleaning:** Use a soft, dry cloth to clean the exterior of the device. Avoid abrasive cleaners or solvents that could damage the finish.
- **Storage:** Store the oscilloscope in a cool, dry environment, away from direct sunlight, extreme temperatures, and high humidity.
- **Probe Care:** Handle probes carefully. Avoid bending or stressing the cables excessively. Keep probe tips clean.
- **Software Updates:** Regularly check the Hantek website for software and firmware updates to ensure optimal performance and access to new features.
- **Ventilation:** Ensure the ventilation slots on the device are not obstructed to prevent overheating.

6. TROUBLESHOOTING

If you encounter issues with your Hantek oscilloscope, refer to the following common problems and solutions.

- **Device Not Recognized:**

  - Ensure the USB cable is securely connected to both the oscilloscope and the PC.
  - Verify that the correct drivers are installed. Reinstall drivers if necessary.
  - Try connecting to a different USB port on your computer.
  - Check if the device requires external 5V power and if it's properly connected.

- **No Waveform Display:**

  - Check if the input probes are correctly connected to the signal source and the oscilloscope channels.
  - Ensure the relevant channels are enabled in the software.
  - Adjust the vertical (Volts/Div) and horizontal (Time/Div) scales to match the expected signal characteristics.
  - Verify trigger settings. Try setting the trigger mode to "Auto" or adjusting the trigger level.
  - Ensure the signal source is active and producing a signal.

- **Software Crashing/Freezing:**

  - Ensure your operating system meets the minimum requirements.
  - Update the Hantek software to the latest version.

- Close other demanding applications running on your PC.
- Restart the software and/or your computer.

- **Inaccurate Measurements:**

  - Perform probe compensation if using passive probes.
  - Ensure proper grounding of the oscilloscope and the circuit under test.
  - Check for external noise sources that might interfere with the signal.
  - Verify that the correct measurement settings (e.g., coupling, bandwidth limit) are applied.

For further assistance, refer to the official Hantek support resources or contact customer service.

7. SPECIFICATIONS

The following image details the key technical specifications for the Hantek 6004BD Series USB Portable Oscilloscopes. Note that bandwidth may vary by specific model (e.g., Hantek6074BD, Hantek6104BD, Hantek6204BD, Hantek6254BD).

Model	Hantek6074BD/Hantek6104BD/Hantek6204BD/Hantek6254BD
Bandwidth	70MHz/100MHz/200MHz/250MHz
Channel	4 CH
Real-time Sampling Rate	1GSa/s
Memory Depth	64K
Time Base Precision	±50ppm
Time Base Range	2ns/div-1000s/div (1-2-4 sequences)
Input Impedance	1MΩ 25pF
Input Sensitivity	2mV/div~10V/div
Vertical Resolution	8Bit
Vertical Displacement Range	2mV~10V/div @ x1 probe; 20mV~100V/div @ x10 probe; 200mV~1000V/div @ x100 probe; 2V~10000V/div @ x1000 probe
DC Gain Accuracy	±3%
Bandwidth Limit	20MHz
Trigger Mode	Edge, Pulse, Video, Alternative
Trigger Source	CH1, CH2, CH3,CH4
Waveform Signal Process	+,-,x,÷,FFT, Invert
Cursors Measurement	Cross, Trace, Horizontal, Vertical
Auto Measurement	Vpp, Vamp, Vmax, Vmin, Vtop, Vmid, Vbase, Vavg, Vrms, Vcrms, Preshoot, Overshoot, Frequency, Period, Rise Time, Fall Time, Positive Width, Negative Width, Duty Cycle
Arbitrary Waveform Generator Mode	
Waveform Frequency	DC~25MHz
DAC	2K~200MHz adjustable
Frequency Resolution	0.10%
Channel	1CH waveform output
Waveform Depth	2KSa
Vertical Resolution	12 bit
Frequency Stability	<30ppm
Wave Amplitude	±3.5V Max.
Output Impedance	50 Ω
Output Current	50mA, Ipeak=50mA
System BW	25M
Harmonic Distortion	-50dBc(1KHz), -40dBc(10KHz)
General Features	
Volume	175mm * 105mm * 25mm
Weight	0.9KG
Accessory	2 passive probes, 2 gator clip lines, 1 BNC to BNC cord

Figure 7.1: Detailed technical specifications for the Hantek 6004BD Series Oscilloscopes, including model-specific bandwidths, sampling rates, input sensitivity, and waveform generator parameters.

7.2 General Product Specifications

Physical and Environmental Specifications

Feature	Specification
Manufacturer	Hantek
Item Weight	1.5 kg
Product Dimensions (L x W x H)	17.5 x 10.5 x 2.5 cm
Model Number	Q-Hantek6074BD
Color	Black
Style	USB Storage Oscilloscope
Material	Acrylonitrile Butadiene Styrene (ABS), Anodized Aluminum
Wattage	1 watts
Item Package Quantity	1
Measurement System	Metric
Measurement Accuracy	0.3%
Certifications	CE, ISO 9001, RoHS
Included Components	Hantek6074BD kit (2 passive probes, 2 gator clip lines, 1 BNC to BNC cord)
Date First Available	June 4 2023
Country of Origin	China

8. WARRANTY AND SUPPORT

Hantek products are designed for reliability and performance. For specific warranty details, please refer to the warranty card included with your product or visit the official Hantek website.

For technical support, software downloads, and frequently asked questions, please visit the official Hantek website at www.hantek.com. You may also contact Hantek customer service through the contact information provided on their website.