Hantek DSO4254C

Hantek DSO4254C Digital Oscilloscope User Manual

Model: DSO4254C

1. Introduction

This manual provides comprehensive instructions for the Hantek DSO4254C Digital Oscilloscope. The DSO4254C is a versatile 4-channel instrument featuring a 250 MHz bandwidth, 1GSa/s sample rate, and an integrated 1-channel arbitrary function waveform generator. It is designed for precise signal analysis and generation in various applications.

Key features include over 32 types of auto measurement functions, an advanced digital trigger system with high sensitivity, and more than 14 trigger types (edge, overtime, pulse, pattern, interval, etc.). It also supports serial bus triggering and decoding, displaying protocol information intuitively. The integrated function/arbitrary signal generator offers 25MHz, 12-bit resolution, and 200MHz DDS, capable of producing various waveforms such as square, sine, triangular, trapezoidal, impulse, and DC. Connectivity options include USB Host/Device for PC communication and U-stick storage/system updates, with optional RS232 and LAN ports.

2. Safety Information

Before operating the Hantek DSO4254C, please read and understand all safety instructions to prevent personal injury and damage to the instrument. Keep this manual for future reference.

- **Power Supply:** Use only the specified power adapter and voltage range (110-230V). Ensure the power cord is in good condition and properly grounded.
- **Environment:** Operate the oscilloscope in a dry, well-ventilated area, away from direct sunlight, high temperatures, humidity, and corrosive gases.
- **Ventilation:** Do not block the ventilation openings on the instrument. Adequate airflow is essential to prevent overheating.
- **Probes:** Always use probes with appropriate voltage ratings. Do not exceed the maximum input voltage specified for the oscilloscope.
- **Cleaning:** Disconnect power before cleaning. Use a soft, dry cloth. Do not use liquid or aerosol cleaners.

- **Servicing:** Refer all servicing to qualified service personnel. Do not attempt to open or repair the instrument yourself.

3. Package Contents

Verify that all items listed below are included in your package. If any items are missing or damaged, contact your supplier immediately.

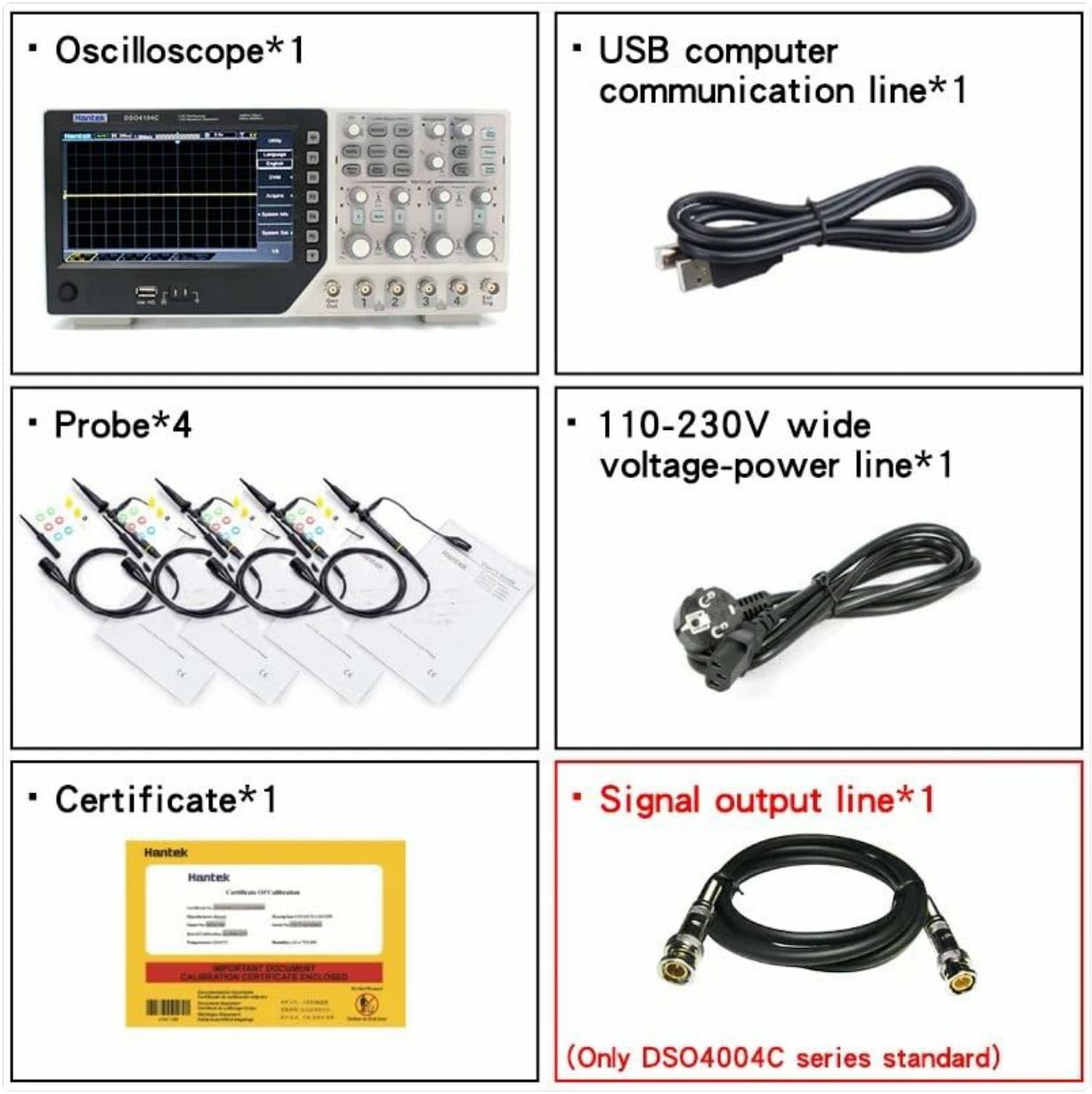

Figure 3.1: Hantek DSO4254C Package Contents

- Hantek DSO4254C Digital Oscilloscope Unit (x1)
- Oscilloscope Probes (x4)
- USB Computer Communication Line (x1)
- 110-230V Wide Voltage Power Line (x1)
- Calibration Certificate (x1)
- Signal Output Line (x1) - Standard for DSO4000C series

4. Product Overview

The Hantek DSO4254C is a high-performance digital oscilloscope designed for a wide range of electronic testing and measurement applications. It combines a 4-channel oscilloscope with an external trigger, arbitrary function generator (AFG), digital voltmeter (DVM), and auto-ranging capabilities.

4.1 Front Panel

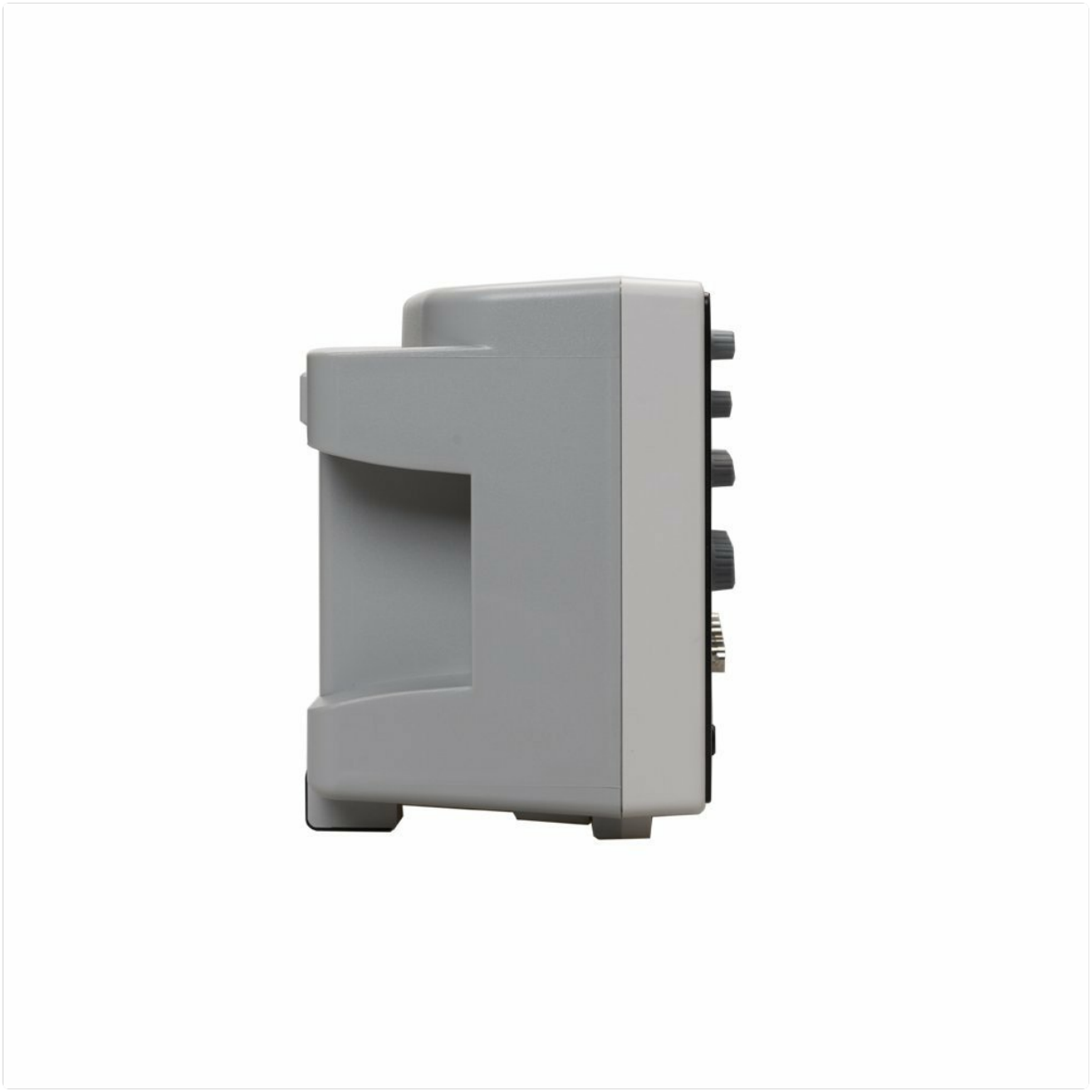

Figure 4.1: Front Panel Layout

The front panel features the main display, channel input connectors (CH1-CH4), external trigger input, function generator output, and various control knobs and buttons for navigation, vertical and horizontal adjustments, trigger settings, and measurement functions.

4.2 Side Panel

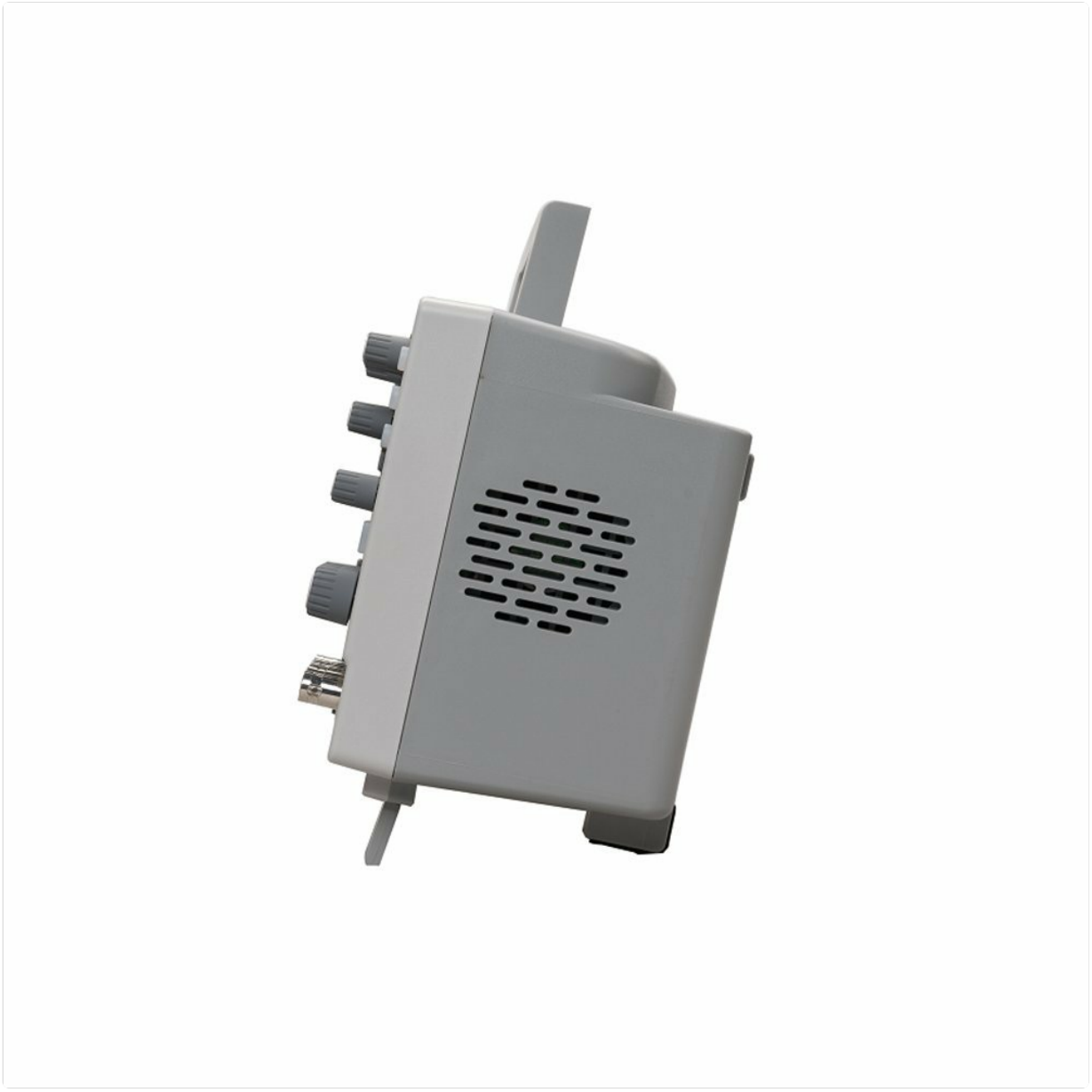

Figure 4.2: Side Panel

The side panel typically includes ventilation grilles for heat dissipation and may house additional ports or controls depending on the specific model configuration.

4.3 Rear Panel

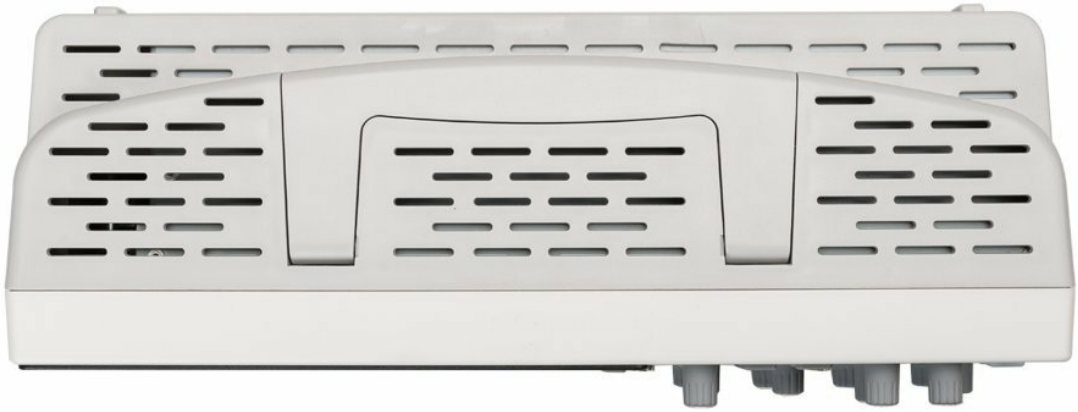

Figure 4.3: Rear Panel Layout

The rear panel provides the main power input, USB Host/Device ports for PC communication and storage, and optional RS232 and LAN ports for remote control and network connectivity.

5. Setup

Follow these steps to set up your Hantek DSO4254C Digital Oscilloscope for initial use.

1. **Unpacking:** Carefully remove the oscilloscope and all accessories from the packaging. Inspect for any signs of damage.
2. **Power Connection:** Connect the provided 110-230V power line to the power input on the rear panel of the oscilloscope, then plug it into a grounded AC power outlet.
3. **Power On:** Press the power button, usually located on the front or side panel, to turn on the oscilloscope. The display should illuminate.
4. **Probe Connection:** Connect the oscilloscope probes to the desired input channels (CH1-CH4) on the front panel. Ensure a secure connection.
5. **Probe Compensation:** Before taking measurements, perform probe compensation to ensure accurate readings. Connect the probe tip to the probe compensation output (usually a square wave signal) and

adjust the probe until a flat-top square wave is displayed.

6. **USB/PC Connection (Optional):** If connecting to a PC, use the provided USB communication line to connect the oscilloscope's USB Device port to your computer. Install the necessary drivers and software from Hantek's official website.

6. Operating Instructions

This section outlines the basic operation of the oscilloscope and its integrated functions.

6.1 Basic Oscilloscope Operation

- **Channel Selection:** Use the channel buttons (CH1, CH2, CH3, CH4) to enable or disable specific input channels.
- **Vertical Scale (VOLTS/DIV):** Adjust the vertical scale knob for each channel to change the voltage per division displayed on the screen.
- **Vertical Position:** Use the vertical position knob to move the waveform up or down on the screen.
- **Horizontal Scale (SEC/DIV):** Adjust the horizontal scale knob to change the time per division, controlling the time base of the display.
- **Horizontal Position:** Use the horizontal position knob to shift the waveform left or right.
- **Trigger Settings:**
  - **Trigger Level:** Adjust the trigger level knob to set the voltage point at which the oscilloscope captures a stable waveform.
  - **Trigger Mode:** Select trigger modes such as Auto, Normal, or Single.
  - **Trigger Type:** Choose from various trigger types including Edge, Overtime, Pulse, Pattern, and Interval.
- **Auto Measurement:** The DSO4254C supports over 32 types of automatic measurements. Access these through the measurement menu to display parameters like Vpp, Vmax, Vmin, Freq, Period, etc.
- **Auto Range Function:** Utilize the auto range feature for quick setup of vertical and horizontal scales.

6.2 Arbitrary Function Generator (AFG) Operation

- **Output Connection:** Connect the signal output line from the AFG port on the front panel to the circuit or device you wish to test.
- **Waveform Selection:** Navigate to the AFG menu to select the desired waveform type (e.g., sine, square, triangular, arbitrary).
- **Frequency/Amplitude Adjustment:** Set the frequency, amplitude, and offset parameters for the generated waveform using the corresponding controls or menu options.
- **Output Enable:** Ensure the AFG output is enabled to generate the signal.

6.3 Data Storage and Communication

- **U-Stick Storage:** Insert a USB flash drive into the USB Host port to save waveforms, screenshots, or instrument settings.
- **PC Communication:** Use the USB Device port and Hantek software to control the oscilloscope remotely, transfer data, or update firmware.
- **SCPI Commands:** The oscilloscope supports SCPI remote control commands for automated testing and integration with external systems. Refer to the programming manual for detailed commands.

7. Maintenance

Proper maintenance ensures the longevity and accuracy of your Hantek DSO4254C.

- **Cleaning:** Regularly clean the exterior of the oscilloscope with a soft, dry, lint-free cloth. For stubborn dirt, a slightly damp cloth with mild detergent can be used, ensuring no liquid enters the instrument. Do not use abrasive cleaners or solvents.
- **Ventilation:** Keep the ventilation openings clear of dust and debris to maintain proper airflow and prevent overheating.
- **Probe Care:** Handle probes carefully. Avoid bending or stressing the cables. Store them properly to prevent damage.
- **Calibration:** While the instrument is factory calibrated, periodic calibration by qualified personnel is recommended to maintain measurement accuracy, especially after significant temperature changes or prolonged use.
- **Firmware Updates:** Check the Hantek official website periodically for firmware updates to ensure optimal performance and access to new features.

8. Troubleshooting

This section provides solutions to common issues you might encounter. If the problem persists, contact technical support.

Problem	Possible Cause	Solution
No display after power on	Power cable not connected; Power switch off; Faulty power supply	Check power cable connection; Ensure power switch is ON; Test with a different power outlet.
No waveform displayed	Probe not connected; Channel disabled; Vertical scale too high/low; Trigger not set correctly	Connect probe to signal source; Enable channel; Adjust VOLTS/DIV; Adjust trigger level and mode.
Unstable waveform	Incorrect trigger settings; Noisy signal	Adjust trigger level and source; Select appropriate trigger type; Ensure signal source is stable.
Incorrect measurements	Probe compensation incorrect; Incorrect measurement settings	Perform probe compensation; Verify measurement parameters in the menu.
USB communication failure	Incorrect cable; Driver not installed; Software issue	Ensure correct USB cable; Install Hantek drivers; Restart PC and oscilloscope.

9. Specifications

Below are the key technical specifications for the Hantek DSO4254C Digital Oscilloscope.

- **Model:** DSO4254C
- **Channels:** 4 Oscilloscope Channels + 1 Arbitrary Function Generator Channel + EXT + DVM

- **Bandwidth:** 250 MHz
- **Sample Rate:** 1 GSa/s (single channel), 500 MSa/s (dual channel)
- **Minimum Vertical Range:** 500 µV / div
- **Auto Measurement Functions:** Over 32 types
- **Trigger System:** Advanced digital trigger, high sensitivity
- **Trigger Functions:** Over 14 types (edge, overtime, pulse, pattern, interval, etc.)
- **Serial Bus Triggering & Decode:** Supported
- **Arbitrary Function Generator:**
  - **Frequency:** 25 MHz
  - **Resolution:** 12 Bits
  - **DDS:** 200 MHz
  - **Waveforms:** ARB, Square, Sine, Triangular, Trapezoidal, Impulse, DC
- **Connectivity:** Integrated USB Host/Device, optional RS232 port, optional LAN port
- **Dimensions (L x W x H):** 21 x 11 x 16 cm
- **Weight:** 1.5 kg
- **Power Supply:** 110-230V wide voltage
- **Certifications:** CE, ISO 9001, RoHS
- **Operating Temperature:** Up to 60 Degrees Celsius
- **Country of Origin:** China

10. Warranty and Support

Hantek provides reliable support for its products. Please refer to the information below for warranty details and how to obtain technical assistance.

- **Warranty:** The product comes with a manufacturer's warranty. Please refer to the warranty card included in your package or contact Hantek customer service for specific terms and conditions.
- **Spare Parts Availability:** Spare parts are available for 1 year from the date of purchase.
- **Technical Support:** For technical assistance, troubleshooting, or service inquiries, please visit the official Hantek website or contact their customer support team. Have your model number (DSO4254C) and purchase information ready.