AURSINC NanoVNA H4

AURSINC NanoVNA-H4 Vector Network Analyzer

INSTRUCTION MANUAL

Model: NanoVNA H4 | Brand: AURSINC

Introduction

The AURSINC NanoVNA-H4 is a compact and portable Vector Network Analyzer designed for measuring RF parameters across a wide frequency range. This device is suitable for ham radio operators, electrical engineers, and antenna builders for tasks such as antenna performance measurement, S-parameter testing, and coaxial cable analysis. This manual provides essential information for the proper setup, operation, and maintenance of your NanoVNA-H4.

What's Included

Verify that all items are present in your package:

- 1 x NanoVNA-H4 Host (with built-in 1950mAh battery)
- 1 x EVA Hard Shell Protective Storage Bag
- 1 x 4pcs SMA Male Calibration Kit (Open, Short, Load, SMA female-to-female connector)
- 2 x 6.3-inch (16cm) SMA Male-to-Male RG174 RF Cables
- 1 x USB Type-C Data Cable
- 1 x Type-C to Type-C Cable
- 1 x Lanyard (with integrated stylus)
- 1 x Extra Stylus Pen
- 1 x User Manual

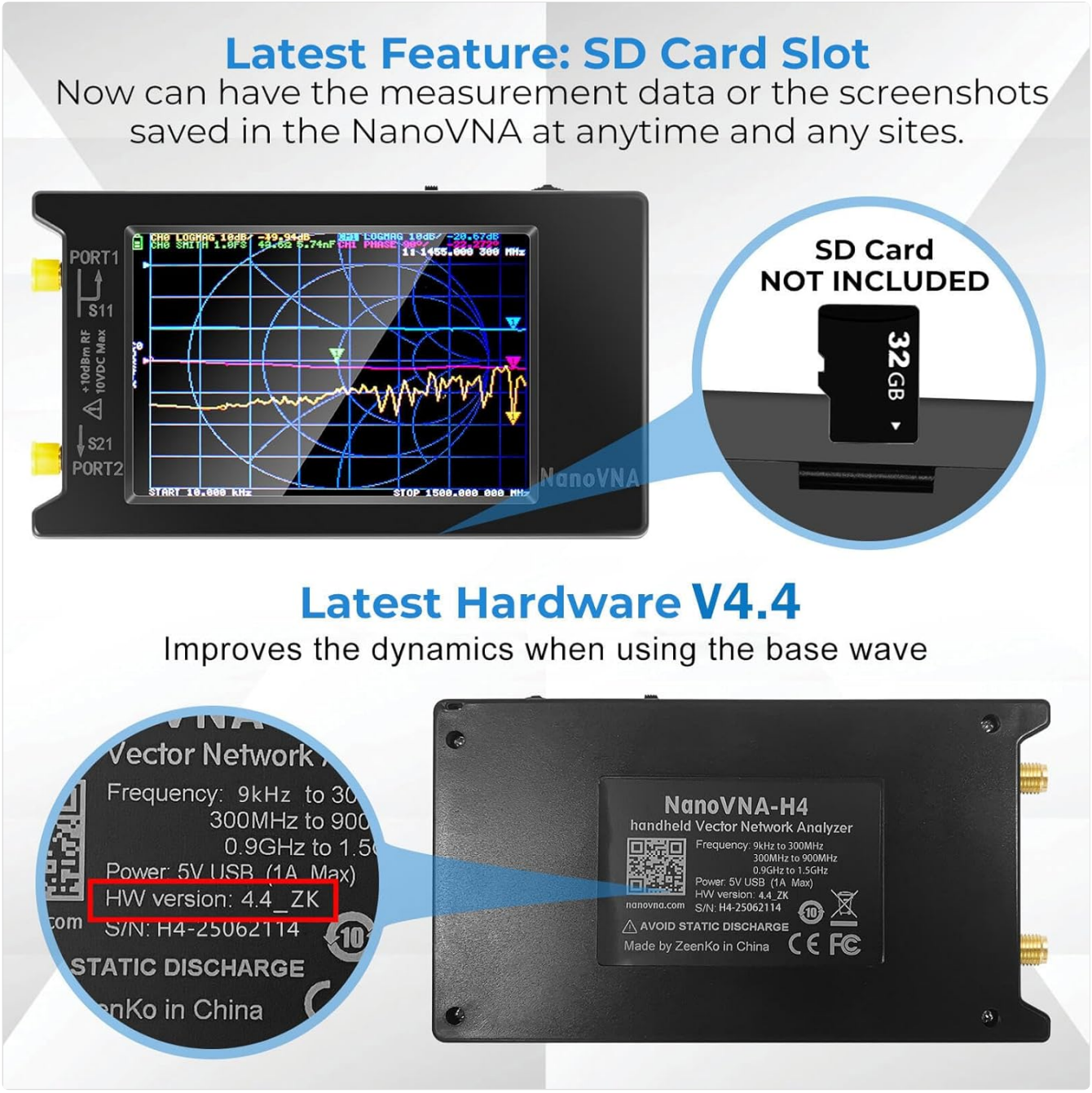

Image: The NanoVNA-H4 device shown with its protective case, calibration kit, cables, and stylus.

Product Features

- **Frequency Range:** 9KHz to 1.5GHz, supporting measurements for HF, VHF, and UHF bands.
- **Display:** 4.0-inch LCD touchscreen for clear data visualization and sensitive operation.
- **Dynamic Range:** Better than 70dB (9KHz-300MHz), 60dB (300M-900MHz), and 40dB (900M-1.5GHz).
- **Data Storage:** Built-in Micro-SD port supporting up to 32GB memory cards (not included) for saving measurement data and screenshots.
- **TDR Functionality:** Time Domain Reflectometry (TDR) for measuring coaxial cable length and locating faults.
- **Connectivity:** USB Type-C for PC connection and data transfer, compatible with NanoVNASaver software for Windows and Android apps.
- **Portability:** Compact design with a durable EVA hard shell protective storage bag for easy transport and protection.

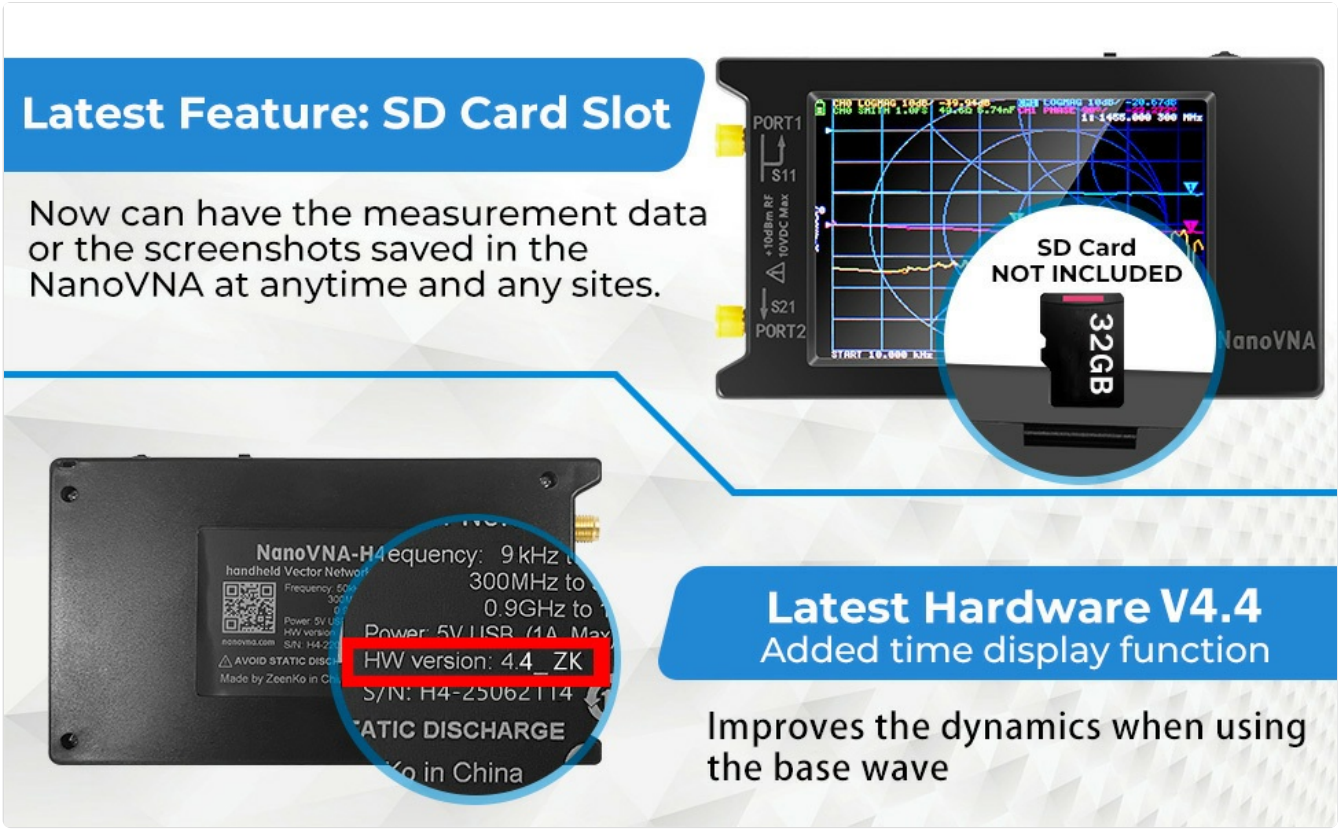

Image: The NanoVNA-H4 device highlighting its 4.0-inch touchscreen and various access ports including Power, SD Card Port, and Multi-functional Switch.

Setup

1. **Initial Charging:** Before first use, connect the NanoVNA-H4 to a USB power source using the provided USB Type-C cable. The device includes a 1950mAh lithium-ion battery. Ensure it is fully charged for optimal performance.
2. **Power On:** Locate the multi-functional switch on the side of the device. Press and hold to power on the unit.
3. **SD Card Insertion (Optional):** If you plan to save measurement data or screenshots directly on the device, insert a Micro-SD card (up to 32GB, not included) into the designated slot. The device allows customization of date and time for data recording.
4. **Connecting Cables:** Connect the RF cables to PORT1 (S11) and PORT2 (S21) as required for your measurement setup. Ensure connections are secure.
5. **Calibration:** For accurate measurements, calibration is essential. Use the provided SMA Male Calibration Kit (Open, Short, Load, and female-to-female connector). Follow the on-screen instructions for calibration procedures specific to your desired frequency range.

Image: The NanoVNA-H4 displaying its screen with measurement data, an SD card slot, and the hardware version (V4.4).

Operating Instructions

1. **Navigating the Interface:** The NanoVNA-H4 features a 4.0-inch touchscreen. Use the included stylus or your finger to interact with the menus and settings.
2. **Setting Frequency Range:** Access the frequency settings to define your desired start and stop frequencies for the sweep. The improved frequency algorithm supports measurements up to 1.5GHz.
3. **Performing Measurements:**
    - **S-Parameters (S11, S21):** The device measures complete S11 (Reflection) and S21 (Transmission) parameters using the TX/RX method. To obtain S12 and S22 parameters, manually rewire the transceiver ports.
    - **TDR Function:** Utilize the TDR function to analyze coaxial cables for length and fault location by calculating impedance discontinuities.
    - **Antenna Analysis:** The default firmware prioritizes antenna performance measurement, displaying parameters like SWR and Smith charts.
4. **Saving Data:**
    - **On-Device:** Save measurement data and screenshots directly to an inserted Micro-SD card.
    - **PC Connection:** Connect the NanoVNA-H4 to a computer using the USB Type-C data cable. Use the NanoVNASaver software to extract data, display it on a larger screen, and save it as Touchstone (.snp) files for use in radio design and simulation tools.
    - **Android Control:** Connect to an Android device using the Type-C to Type-C cable and a compatible Android app for control and data display.

Image: The NanoVNA-H4 connected to a laptop running NanoVNASaver software and an Android phone, demonstrating PC and Android control capabilities.

Maintenance

- **Cleaning:** Use a soft, dry cloth to clean the device, especially the screen. Avoid abrasive cleaners or solvents.
- **Battery Care:** The built-in lithium-ion battery should be charged regularly, even if the device is not in frequent use, to maintain battery health. Avoid fully discharging the battery for extended periods.
- **Firmware Updates:** Periodically check the official NanoVNA website (nanovna.com) for firmware updates. Updates can improve performance and add new features. Refer to the website for detailed instructions on updating firmware, which typically involves using a DFU (Device Firmware Upgrade) tool.
- **Storage:** When not in use, store the NanoVNA-H4 in its provided EVA hard shell protective storage bag. This bag is shockproof, waterproof, and dustproof, protecting the device from scratches and environmental damage. The internal mesh pockets and foam dividers help keep accessories organized.

Image: The NanoVNA-H4 securely stored within its custom EVA hard shell case, demonstrating its protective features and organized accessory storage.

Troubleshooting

- **Device Not Powering On:** Ensure the battery is charged. Connect to a USB power source and try again. If the issue persists, contact customer support.
- **Screen Unresponsive/Frozen:** If the device becomes unresponsive, especially when setting a center frequency above 1GHz, perform a power cycle. Power off the device, wait a few seconds, then power it back on. Using start and stop frequencies instead of center frequency can help avoid this issue.
- **Inaccurate Measurements:** Ensure the device has been properly calibrated for the specific frequency range you are measuring. Check all cable connections for tightness and proper seating. Verify that the correct measurement parameters are selected.
- **PC Software Connection Issues:** Ensure the correct USB drivers are installed on your computer. Try a different USB port or cable. Verify that the NanoVNASaver software is up to date.
- **Random Menu Operation:** This can sometimes occur due to minor clearance issues between the screen and the case. Holding the unit by its edges or applying a small spacer (e.g., tape) on the far right edge of the screen can mitigate this.

Specifications

Feature	Specification
Product Dimensions	2.13 x 3.35 x 0.47 inches
Item Weight	3.52 ounces
Item Model Number	NanoVNA H4

Feature	Specification
Batteries	1 Lithium Ion battery (included, 1950mAh)
Brand	AURSINC
Color	Black
Number of Channels	1
Impedance	50 Ohms
Measurement Frequency	9KHz - 1.5GHz
Display	4 inch TFT (320 x 240) Touchscreen
RF Output	0dBm (±2dBm)
Port SWR	< 1.1
USB Interface	USB Type-C (CDC serial communication mode)
Number of Scanning Points	101 (fixed)

Warranty & Support

AURSINC is committed to providing quality products and customer satisfaction.

- **Exchange or Return:** The product is eligible for exchange or return within 30 days of purchase.
- **Warranty:** A 365-day warranty covers manufacturing defects and malfunctions under normal use.
- **Customer Service:** For any questions, concerns, or technical assistance, please contact AURSINC customer service. Support is available within 24 hours.