**AURSINC NanoVNA-H4**

# AURSINC NanoVNA-H4 Vector Network Analyzer

User Instruction Manual

## 1. Introduction

The AURSINC NanoVNA-H4 is an upgraded Vector Network Analyzer designed for precise measurement of S-parameters, SWR, phase, delay, and Smith Chart analysis. Featuring the latest V4.4 firmware and a 4-inch touch screen, this compact and handheld device operates within a frequency range of 9KHz to 1.5GHz, making it suitable for HF, VHF, and UHF applications. It is an essential tool for ham radio operators, electrical engineers, and antenna builders.

## 2. Safety Information

Observe the following safety guidelines to ensure proper operation and prevent damage to the device or injury:

- Do not expose the device to extreme temperatures, humidity, or direct sunlight.
- Avoid strong impacts or dropping the device.
- Ensure proper static discharge precautions are taken when handling the device, especially when connecting or disconnecting cables.
- Do not attempt to disassemble or modify the device. Refer all servicing to qualified personnel.
- Before connecting any external antennas, ensure they are discharged to prevent static damage to the analyzer's input.

## 3. Package Contents

Verify that all items listed below are included in your package:

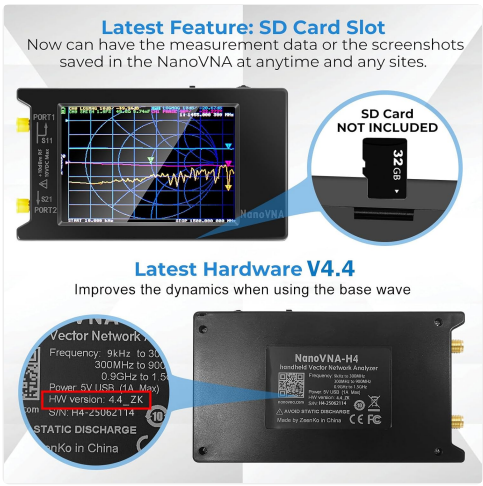



- 1x NanoVNA-H4 host (with 1950mAh battery)
- 4pcs SMA male calibration kit (open/short/load/SMA female to female connector)
- 2x 16cm/6.3inch SMA male to male RG174 RF cable
- 1x USB Type-C data cable
- 1x Type-C to Type-C cable
- 1x Lanyard with stylus
- 1x Stylus pen
- 1x User Manual

Image: The NanoVNA-H4 unit displayed with all its accompanying accessories, including cables, calibration kit, and stylus.

## 4. Product Features and Overview

### 4.1. Latest Hardware and Firmware (V4.4)




The NanoVNA-H4 features the latest V4.4 hardware and firmware, developed by Hugen. This version significantly improves dynamic range, especially when utilizing the base wave. It includes a dedicated Micro SD card slot for convenient data storage, supporting up to 32GB memory cards (not included). The hardware version is clearly marked as V4.4 ZK on the device's rear panel.

Image: A close-up of the NanoVNA-H4 highlighting the Micro SD card slot and the V4.4 hardware version label on the back of the unit.

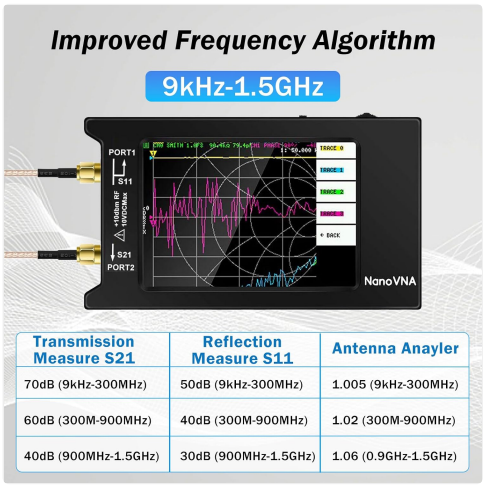
### 4.2. 4.0-inch Touch Screen Display




Equipped with a 4.0-inch LCD touchscreen, the NanoVNA-H4 provides clear data visualization and sensitive operation. The intuitive interface allows for easy navigation and control of measurement parameters. The device also features a multi-functional switch and LED indicator for additional control and status feedback.

Image: A hand interacting with the 4.0-inch touchscreen of the NanoVNA-H4, demonstrating its touch capabilities. The image also shows the side view with power, SD card port, multi-functional switch, and LED.

## 4.3. Improved Frequency Algorithm (9KHz-1.5GHz)




| Transmission Measure S21 | Reflection Measure S11 | Antenna Anayler |
|---|---|---|
| 70dB (9kHz-300MHz) | 50dB (9kHz-300MHz) | 1.005 (9kHz-300MHz) |
| 60dB (300M-900MHz) | 40dB (300M-900MHz) | 1.02 (300M-900MHz) |
| 40dB (900MHz-1.5GHz) | 30dB (900MHz-1.5GHz) | 1.06 (0.9GHz-1.5GHz) |

The enhanced frequency algorithm utilizes the odd harmonic extension of the Si5351, enabling measurements up to 1.5GHz. The dynamic range performance is as follows:

- 9KHz-300MHz: Better than 70dB dynamic range
- 300MHz-900MHz: Better than 60dB dynamic range
- 900MHz-1.5GHz: Better than 40dB dynamic range

Image: The NanoVNA-H4 screen displaying measurement graphs, illustrating its improved frequency algorithm and wide measurement range.

## 4.4. PC and Android App Control




The NanoVNA-H4 can be connected to a PC via USB Type-C for use with NanoVNASaver software, allowing for data extraction, display on a larger screen, and saving to Touchstone (.snp) files. An Android application is also available for mobile control and analysis, providing flexibility for field use.

Image: The NanoVNA-H4 connected to a laptop running NanoVNASaver software and also connected to an Android smartphone displaying the mobile application interface.

### 4.5. Built-in 1950mAh Rechargeable Battery




The device includes a built-in 1950mAh lithium-ion battery, providing extended operating time. It can be conveniently charged via the USB Type-C port by connecting it to a PC or a compatible USB power adapter. A full charge offers approximately 8 hours of standby time.

Image: The NanoVNA-H4 connected to a laptop via a USB Type-C cable, illustrating the charging process and highlighting the 1950mAh battery capacity and 8-hour standby time.

## 5. Setup

### 5.1. Initial Charging

Before first use, fully charge the NanoVNA-H4. Connect the supplied USB Type-C cable to the device's USB-C port and the other end to a computer's USB port or a 5V/1A USB power adapter. The charging indicator will show the charging status.

### 5.2. Powering On/Off

To power on the device, press and hold the multi-functional switch located on the side. To power off, press and hold the same switch until the screen turns off.

### 5.3. Inserting Micro SD Card

Locate the Micro SD card slot on the side of the device. Gently insert a Micro SD card (up to 32GB, not included) until it clicks into place. Ensure the card is inserted in the correct orientation.

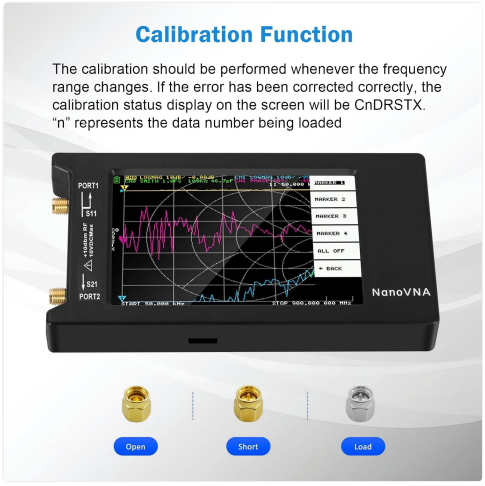
# 6. Operation

## 6.1. Basic Navigation

The NanoVNA-H4 is primarily controlled via its 4.0-inch touchscreen. Tap on menu options and parameters to select them. The multi-functional switch can also be used for navigation and selection in some menus.

## 6.2. Calibration

Calibration is crucial for accurate measurements and should be performed whenever the frequency range changes or for precise results. The calibration status will be displayed on the screen (e.g., "CnDRSTX" if corrected).




1. Access the calibration menu from the main screen.
2. Connect the "OPEN" standard to Port 1 (S11) and perform the open calibration.
3. Connect the "SHORT" standard to Port 1 (S11) and perform the short calibration.
4. Connect the "LOAD" standard to Port 1 (S11) and perform the load calibration.
5. For transmission measurements (S21), connect the "THRU" cable between Port 1 and Port 2 and perform the thru calibration.
6. Save the calibration data.

Image: The NanoVNA-H4 screen showing a measurement graph, with the Open, Short, and Load calibration standards displayed below the unit.

## 6.3. Measuring S-Parameters (S11, S21)

The device primarily measures S11 (Reflection) and S21 (Transmission) parameters. S11 measures the reflection coefficient of a device connected to Port 1, while S21 measures the transmission coefficient from Port 1 to Port 2.

- Connect the device under test (DUT) to Port 1 for S11 measurements.
- For S21 measurements, connect the DUT between Port 1 and Port 2.
- Adjust the start and stop frequencies as needed.
- The screen will display various plots, including Smith Chart, SWR, LogMag, Phase, and Delay.

## 6.4. TDR Functionality

The NanoVNA-H4 includes Time Domain Reflectometry (TDR) functionality, useful for measuring coaxial cable length and locating faults by identifying impedance discontinuities. Access this function through the device's menu.

### 6.5. Data Storage

Measurement data and screenshots can be saved directly to the inserted Micro SD card. This allows for easy record-keeping and later analysis. The device supports customizing date and time for data recording.

## 7. Maintenance

### 7.1. Cleaning

Wipe the device with a soft, dry cloth. Do not use liquid cleaners or solvents, as they may damage the screen or internal components.

### 7.2. Battery Care

To prolong battery life, avoid fully discharging the battery frequently. Store the device in a cool, dry place when not in use for extended periods. Charge the battery periodically if stored for a long time.

### 7.3. Firmware Updates

Periodically check the official NanoVNA website (http://nanovna.com) for firmware updates. Updating the firmware can provide new features, performance improvements, and bug fixes. Follow the instructions provided on the website carefully when performing updates.

## 8. Troubleshooting

### 8.1. Device Not Powering On

- Ensure the battery is charged. Connect the device to a power source using the USB Type-C cable.
- Verify that the power button is pressed and held sufficiently.

### 8.2. Inaccurate Measurements

- Perform a full calibration using the supplied calibration kit. Calibration is essential for accurate results.
- Check all cable connections for tightness and proper seating.
- Ensure the measurement frequency range is correctly set.

### 8.3. Screen Unresponsive or Frozen

- Try a soft reset by pressing and holding the power button until the device powers off, then restart it.
- Ensure there is no physical pressure on the screen that might cause unintended inputs.

### 8.4. PC/Android Connection Issues

- Ensure the correct drivers are installed on your PC.
- Verify that the USB Type-C cable is functioning correctly and securely connected.
- Check the NanoVNASaver software or Android app for compatibility and updates.

## 9. Specifications

| Parameter | Value |
| --- | --- |
| Model | NanoVNA-H4 |

| | |
|---|---|
| Frequency Range | 9KHz - 1.5GHz |
| Display | 4.0-inch LCD Touch Screen |
| Battery Capacity | 1950mAh Lithium-Ion |
| Dynamic Range (9KHz-300MHz) | > 70dB |
| Dynamic Range (300MHz-900MHz) | > 60dB |
| Dynamic Range (900MHz-1.5GHz) | > 40dB |
| Dimensions | 5.2 x 2.91 x 0.7 inches |
| Weight | 12.8 ounces |
| Interface | USB Type-C |
| Data Storage | Micro SD Card (up to 32GB, not included) |

## 10. Warranty and Support

AURSINC is committed to providing reliable products and excellent customer service.

- **30-Day Exchange or Return:** If you are not satisfied with your purchase, you may exchange or return the product within 30 days.
- **365-Day Warranty:** The NanoVNA-H4 comes with a 365-day warranty covering manufacturing defects.
- **Customer Service:** For any questions, concerns, or technical support, please contact AURSINC customer service. Our dedicated experts are available to assist you promptly.




Images: Visual representations of AURSINC's 30-day exchange/return policy, 365-day warranty, and 24-hour customer service commitment.

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Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page’s manual context to help answer it.

**Name**

Anonymous

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**Question**

Example: How do I reset this device or fix this error?

**Details**

Model number, symptoms, what you tried, or the section of the manual you are using.

**Submit question**