NooElec NanoVNA Bundle

NooElec NanoVNA Bundle: 50kHz-900MHz+ Vector Network Analyzer Instruction Manual

Model: NanoVNA Bundle

Introduction

The NooElec NanoVNA Bundle is an open-hardware vector network analyzer designed for testing RF equipment. This portable device features a 2.8-inch TFT touch screen, allowing for measurements of S-parameters, SWR, phase, and Smith charts. It operates within a frequency range of 50kHz to 900MHz, with potential for extension via custom firmware. The bundle includes essential accessories such as a calibration kit, SMA attenuators, various adapters, and cables.

Image: The complete NooElec NanoVNA Bundle, showcasing the NanoVNA unit, various attenuators, calibration kit components, and connecting cables.

Package Contents

Verify that all items are present in your package:

- NanoVNA Unit with EMI Shielding
- SOLT Calibration Kit (Short, Open, Load, Thru)
- 6-piece SMA Attenuator Kit
- SMA Cables (2x measurement cables, 2x additional cables)
- SMA Adapters (female-to-female, male-to-male)
- USB Charging Cable

Image: A set of six SMA attenuators, ranging from 1dB to 20dB, included in the bundle.

Image: Close-up of SMA calibration kit components, including open, short, and load terminations.

Setup

1. **Charging the Device:** Connect the NanoVNA to a 5V USB power source using the provided USB cable. The internal 400mA Lithium Ion battery will charge.
2. **Initial Power On:** Press and hold the power button (usually located on the top edge) to turn on the device.
3. **Connecting to Components:** Use the provided SMA cables and adapters to connect the NanoVNA to the component under test. The device has two ports, CH0 (S11) and CH1 (S21), for reflection and transmission measurements respectively.
4. **Calibration:** Before taking measurements, perform a calibration using the included SOLT (Short, Open, Load, Thru) calibration kit. This ensures accurate readings. Refer to the operating section for detailed calibration steps.

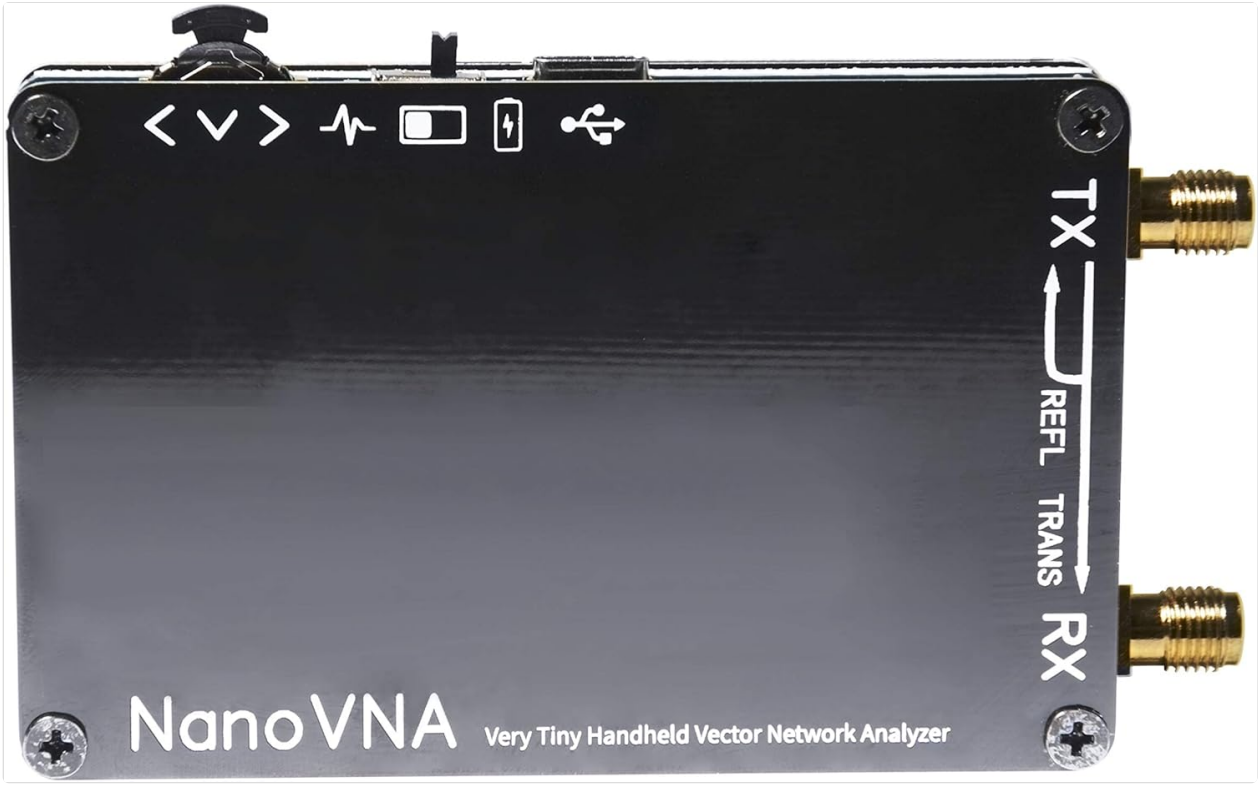

Image: Top view of the NanoVNA unit, showing the CH0 and CH1 SMA ports, and the navigation joystick/button.

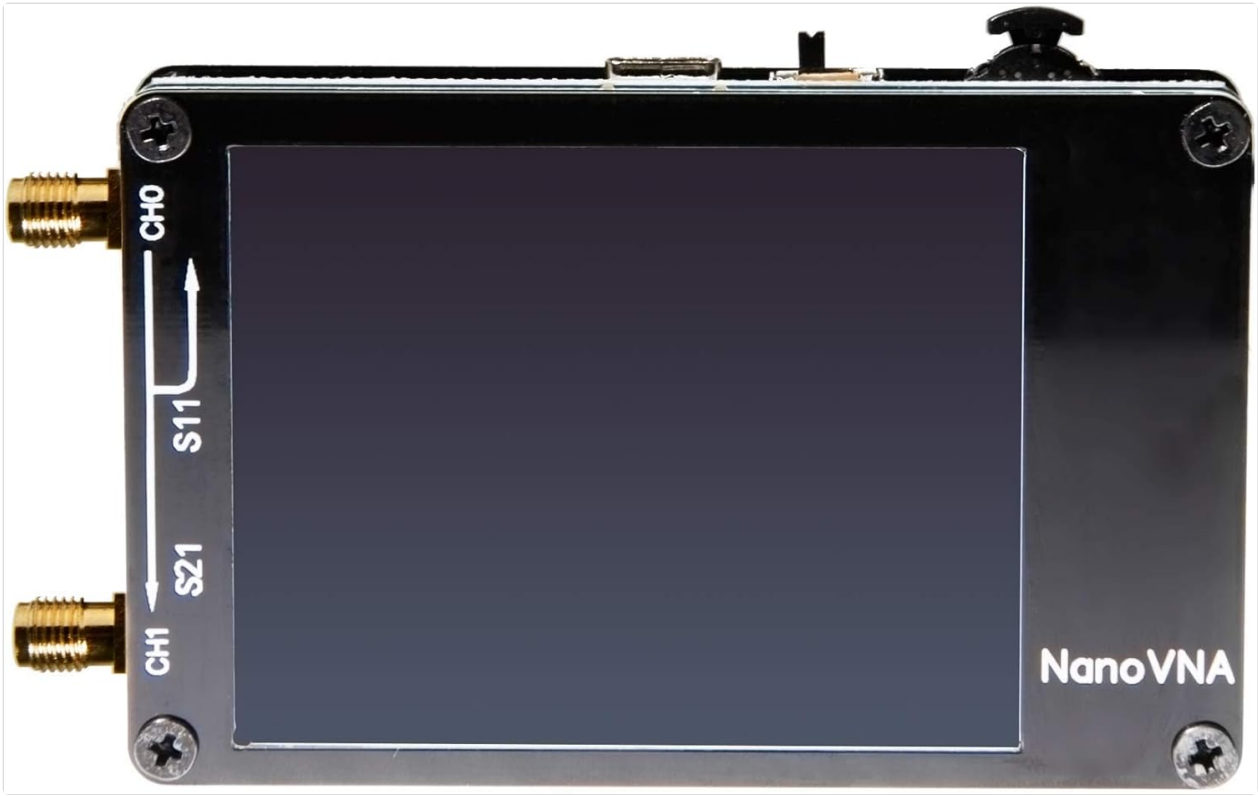

Image: Side view of the NanoVNA, highlighting the USB charging port and power button.

Operating Instructions

User Interface Navigation

The NanoVNA features a 2.8-inch TFT touch screen and a joystick/button for navigation. Use the joystick to move between menu options and press it to select. Touch screen functionality allows for direct interaction with on-screen elements.

Basic Measurements

- **S-Parameters:** The device measures S11 (reflection coefficient) and S21 (transmission coefficient).
- **SWR (Standing Wave Ratio):** Derived from S11, SWR indicates impedance matching.
- **Phase:** Measures the phase shift of the RF signal.
- **Smith Chart:** A graphical tool for visualizing impedance over a range of frequencies.

Calibration Procedure (SOLT)

1. From the main menu, navigate to the "CAL" or "CALIBRATE" option.
2. Select "RESET" to clear previous calibration data.
3. Connect the "OPEN" standard to CH0. Select "OPEN" on the screen.
4. Connect the "SHORT" standard to CH0. Select "SHORT" on the screen.
5. Connect the "LOAD" standard to CH0. Select "LOAD" on the screen.
6. Connect the "THRU" standard between CH0 and CH1. Select "THRU" on the screen.
7. Once all standards are measured, select "DONE" and then "SAVE" to store the calibration.

Note: Calibration is crucial for accurate measurements and should be performed whenever the test setup changes or after a significant temperature variation.

Maintenance

- **Cleaning:** Use a soft, dry cloth to clean the device. Avoid abrasive cleaners or solvents.
- **Battery Care:** The device contains a Lithium Ion battery. For optimal battery life, avoid fully discharging the battery frequently. Store the device with a partial charge if not used for extended periods.
- **Storage:** Store the NanoVNA and its accessories in a dry, dust-free environment, away from extreme temperatures.
- **Firmware Updates:** Periodically check the official NooElec website or community forums for firmware updates. Updates can improve performance, add features, or extend the frequency range.

Troubleshooting

Device does not power on:

Ensure the battery is charged. Connect the device to a 5V USB power source and allow it to charge for at least 30 minutes before attempting to power on again.

Inaccurate measurements:

Perform a full SOLT calibration. Ensure all connections are secure and the correct adapters/cables are used. Verify that the frequency range is set appropriately for your measurement.

Touch screen unresponsive or difficult to use:

The touch screen is small and can be sensitive. Use a stylus or the tip of your finger. Some users find the joystick navigation more precise for certain operations. Ensure the screen is clean and free of debris.

Device not recognized by PC software:

Ensure the correct USB drivers are installed on your computer. Try a different USB port or cable. Refer to online resources for specific PC software setup guides.

Specifications

Feature	Detail
Model Number	Nooelec NanoVNA Bundle
Frequency Range	50kHz - 900MHz (extendable with custom firmware)
Display	2.8 inch TFT Touch Screen
Battery	1 Lithium Ion battery (400mA, included)
Input Voltage	5 Volts (via USB)
Dimensions	9.06 x 7.48 x 0.79 inches
Item Weight	9.9 ounces
Material	Plastic enclosure with EMI shielding

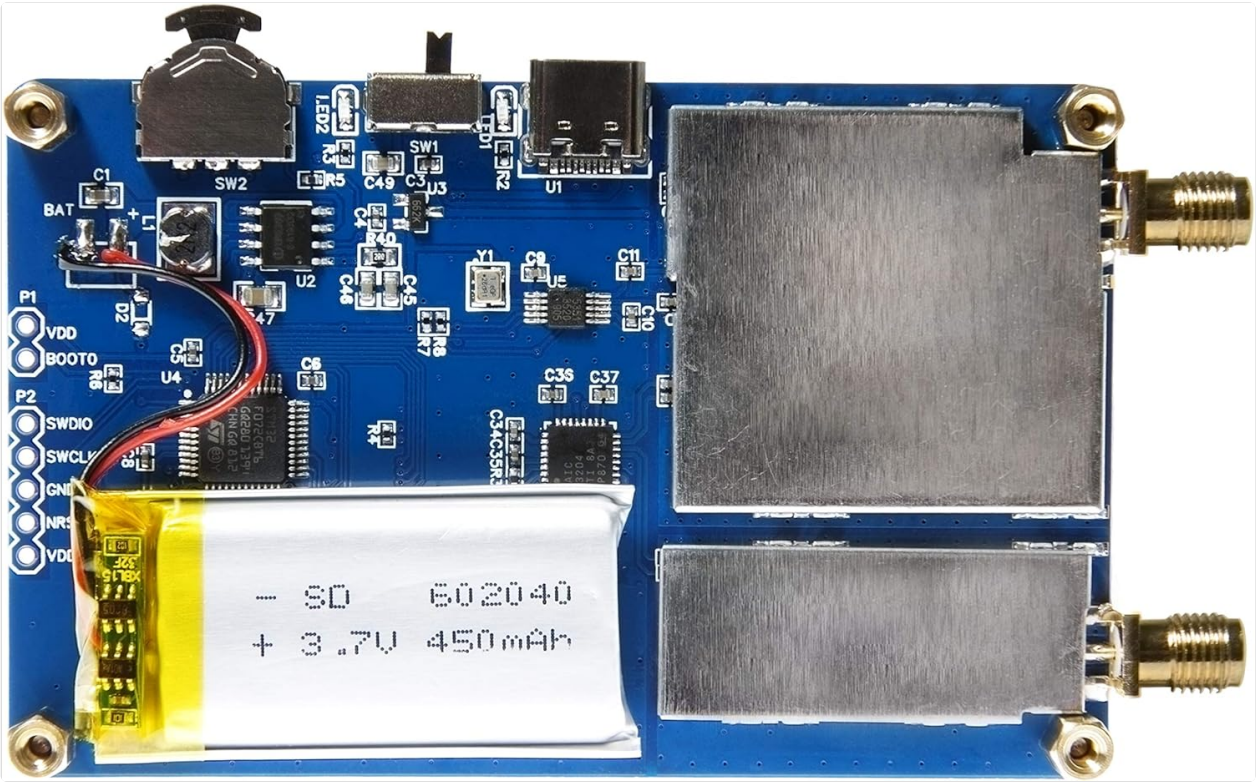

Image: Internal view of the NanoVNA circuit board, showing the battery and the EMI shielding over sensitive RF components.

Warranty Information

The NooElec NanoVNA Bundle comes with a**6-month warranty** from the date of purchase. This warranty covers manufacturing defects and ensures the product functions as intended under normal use. For warranty claims or service, please contact NooElec customer support with your proof of purchase.

Support and Resources

For additional support, detailed tutorials, and community discussions, please refer to the following resources:

- **NooElec Official Website:** Visit the NooElec website for product information and updates.
- **Online Tutorials:** Search for "NanoVNA tutorials" on video platforms like YouTube for visual guides on operation and advanced features. Many users recommend resources such as "ham radio crash course" for quick start guides.
- **Community Forums:** Engage with the NanoVNA user community for tips, tricks, and troubleshooting advice.