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› TinySA Ultra Spectrum Analyzer Instruction Manual

SDRGEEK TinySA Ultra V0.4.5.1

TinySA Ultra Spectrum Analyzer Instruction Manual

Model: TinySA Ultra | Brand: SDRGEEK

INTRODUCTION

The SDRGEEK TinySA Ultra is a versatile and portable 2-in-1 device functioning as both a spectrum analyzer and a signal generator. Designed for electronics enthusiasts and professionals, it offers an ultra-wide frequency range from 100kHz to 5.3GHz, a 4-inch touch screen for clear data visualization, and advanced features like ESD protection. This manual provides comprehensive instructions for setting up, operating, and maintaining your TinySA Ultra to ensure optimal performance and longevity.

WHAT'S IN THE BOX

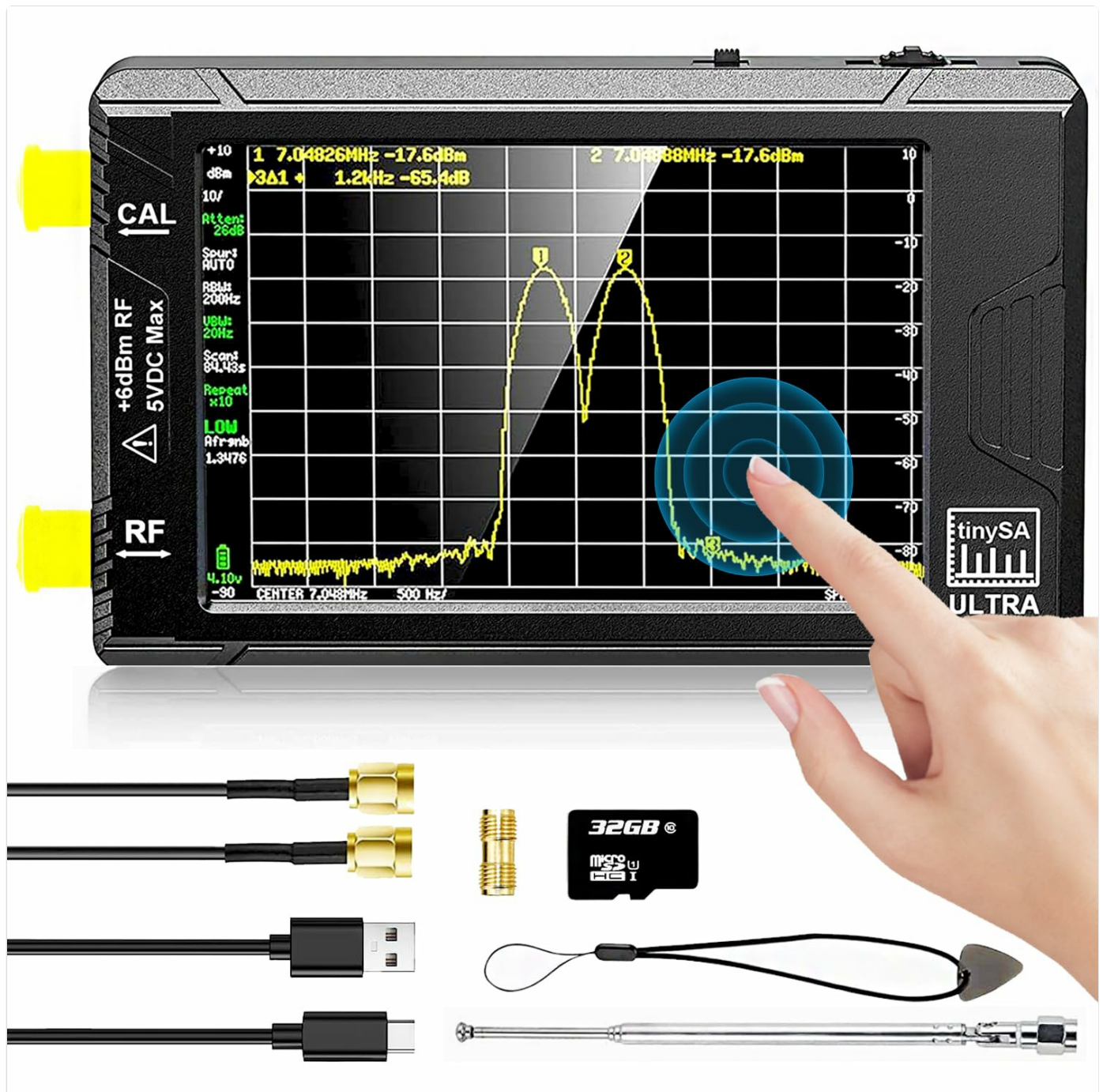


Image: The TinySA Ultra device along with its accessories, including cables, connectors, antenna, and SD card.

- TinySA Ultra Spectrum Analyzer
- 2 x SMA cables
- USB-C Cable
- SMA connector
- Telescopic Antenna
- 32GB Micro SD Card (pre-installed)
- Touchscreen Pen

KEY FEATURES

Ultra-Wide Frequency Range

4INCH Large Touch Screen



100KHz-5.3GHz



4Inch
Large Screen



3000mAh
Battery



Include 32GB
SD Card



PC Control

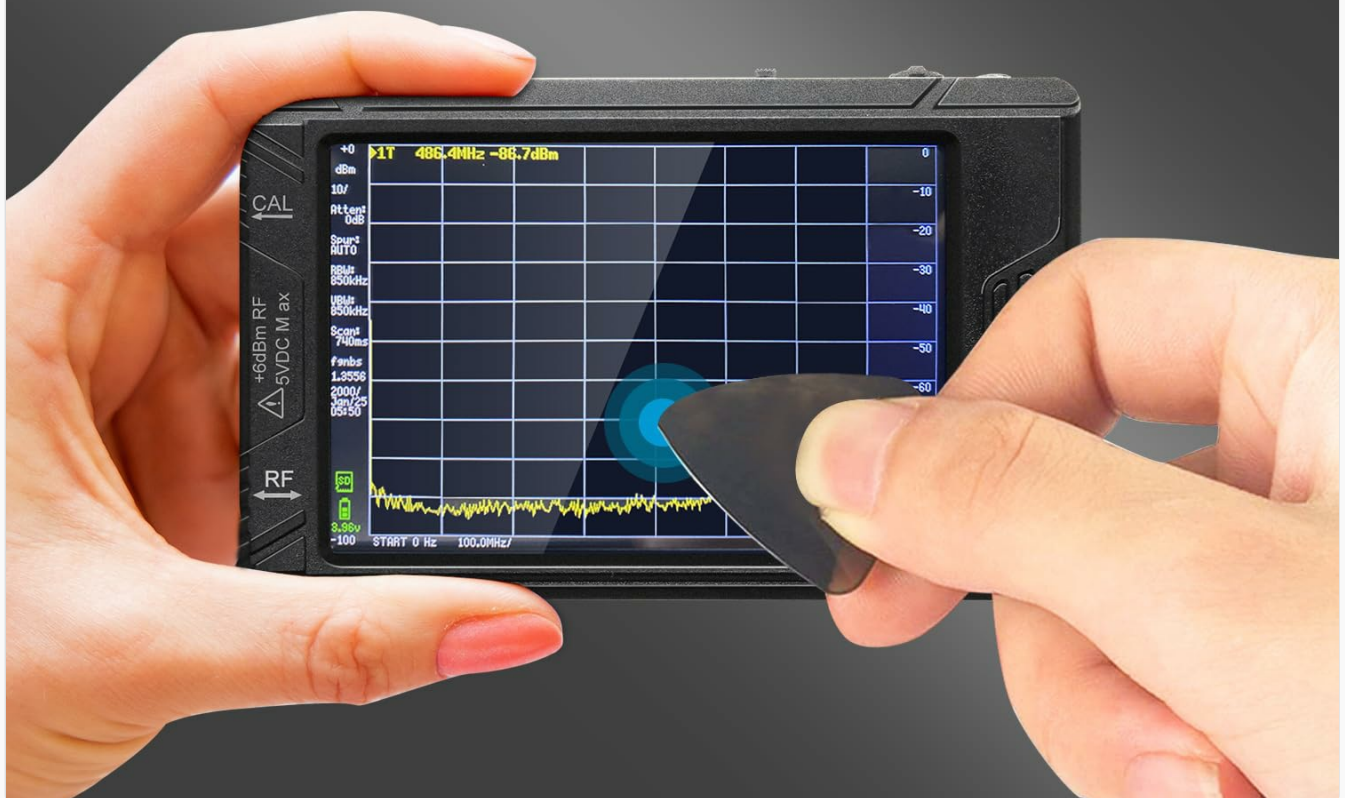


Image: The TinySA Ultra displaying its 4-inch large touch screen, highlighting its frequency range, screen size, battery, SD card, and PC control capabilities.

The TinySA Ultra boasts an impressive frequency range from 100kHz to 5.3GHz. In Spectrum Analyzer mode, it covers 0.1-800MHz, extending up to 6GHz in Ultra mode. This wide range allows for diverse applications in RF analysis.

2-in-1 Functionality: Spectrum Analyzer & Signal Generator

2 in 1 Device



Spectrum Analyzer

ULTRA Mode reach 5.3GHz
High performance in 100k-800MHz

RF Signal Generator

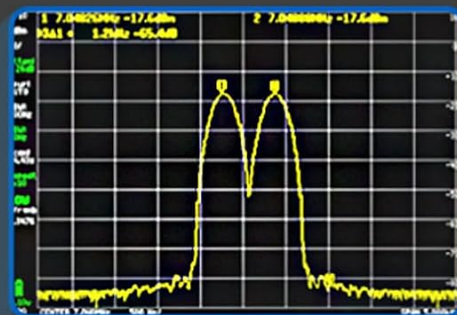
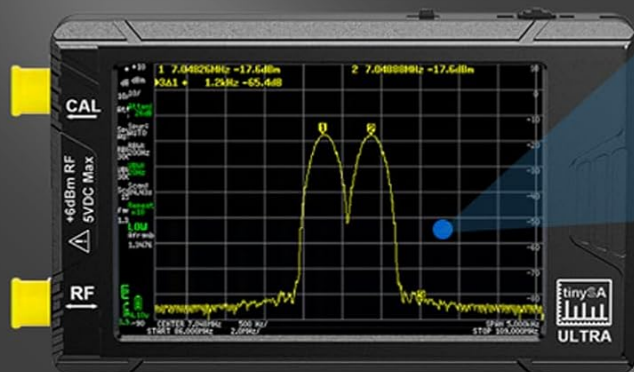
100k-800MHz sine wave output
800MHz-4.4GHz square wave output
4.4GHz-5.4GHz mixing signal output



Image: A visual representation of the TinySA Ultra's dual capabilities: Spectrum Analyzer (up to 5.3GHz) and RF Signal Generator (100kHz-5.4GHz outputs).

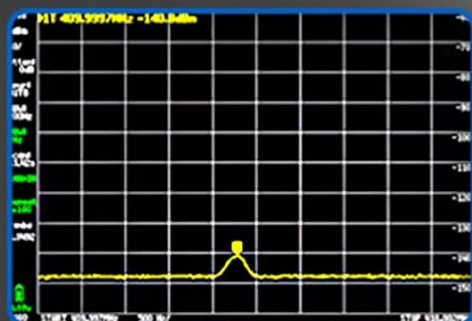
This device serves a dual purpose, acting as both a powerful spectrum analyzer and a versatile signal generator. The signal generator provides sine wave output from 100kHz-800MHz, square wave output from 800MHz-4.4GHz, and mixing signal output from 4.4GHz-5.4GHz.

Advanced Resolution Bandwidth (RBW)



200Hz-850kHz RBW

- ▶ Adjacent signals effectively distinguished when RBW reach 200Hz
- ▶ Meet SSB two-tone test requirements
- ▶ Maximum width 850kHz
- ▶ RBW implements fast scanning



Excellent Background Noise

- ▶ DANL-166dBm/Hz
- ▶ Separate signal-140dBm at 200Hz RBW(LNA ON)

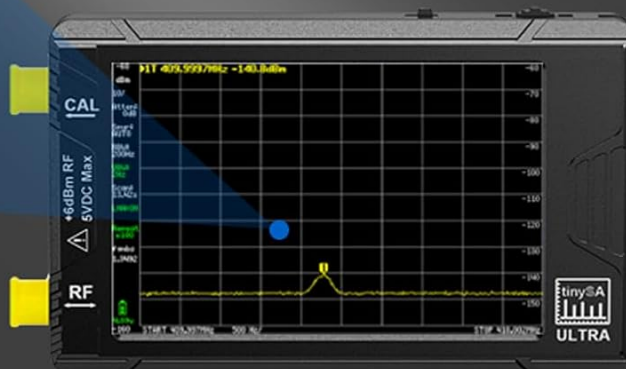


Image: Screenshots from the TinySA Ultra demonstrating the effectiveness of its 200Hz-850kHz RBW for distinguishing signals and its low background noise.

With a Resolution Bandwidth (RBW) ranging from 200Hz to 850kHz, the TinySA Ultra can effectively distinguish adjacent signals, meeting the requirements for SSB two-tone tests. The RBW also enables fast scanning for efficient analysis.

Integrated 32GB SD Card & PC Control

Support PC Control

- ▶ Support TinySA-APP
- ▶ Sync display to PC
- ▶ Transfer data to PC
- ▶ Compatible with Windows, Linux, MacOS



Image: The TinySA Ultra connected via USB to a laptop, illustrating its PC control capabilities and the ability to sync display and transfer data.

A built-in 32GB micro SD card allows for direct data recording, simplifying data sharing and storage. Furthermore, the device supports PC control via the TinySA-APP, enabling display synchronization and data transfer to Windows, Linux, and macOS computers.

Long-lasting Battery & ESD Protection

Built-in **3000mAh** Rechargeable Battery

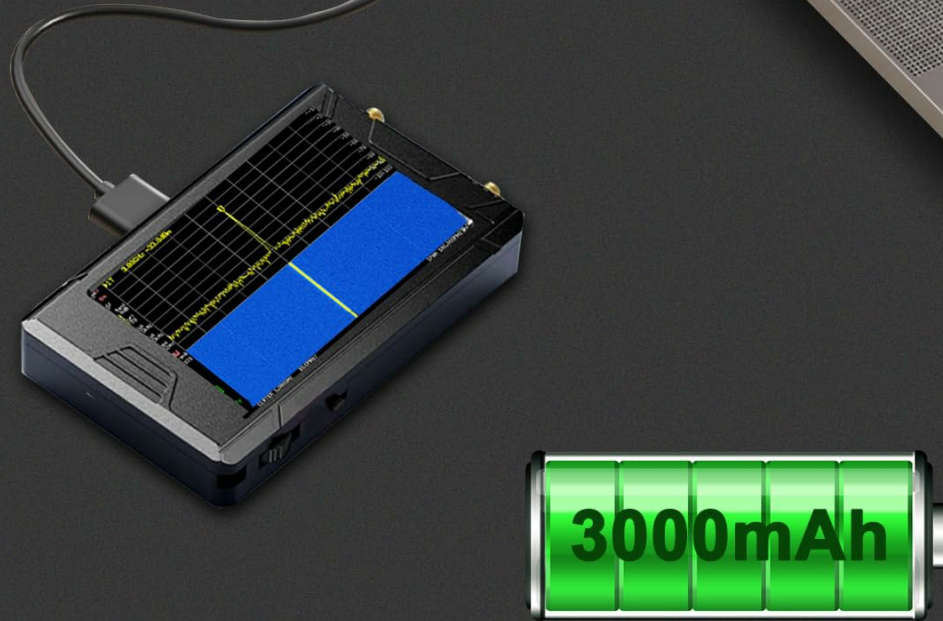


Image: The TinySA Ultra connected to a laptop for charging, emphasizing its built-in 3000mAh rechargeable battery.

Equipped with a 3000mAh rechargeable battery, the TinySA Ultra provides up to 8 hours of continuous use. It also features enhanced ESD protection, ensuring professional and stable operation.

Physical Overview

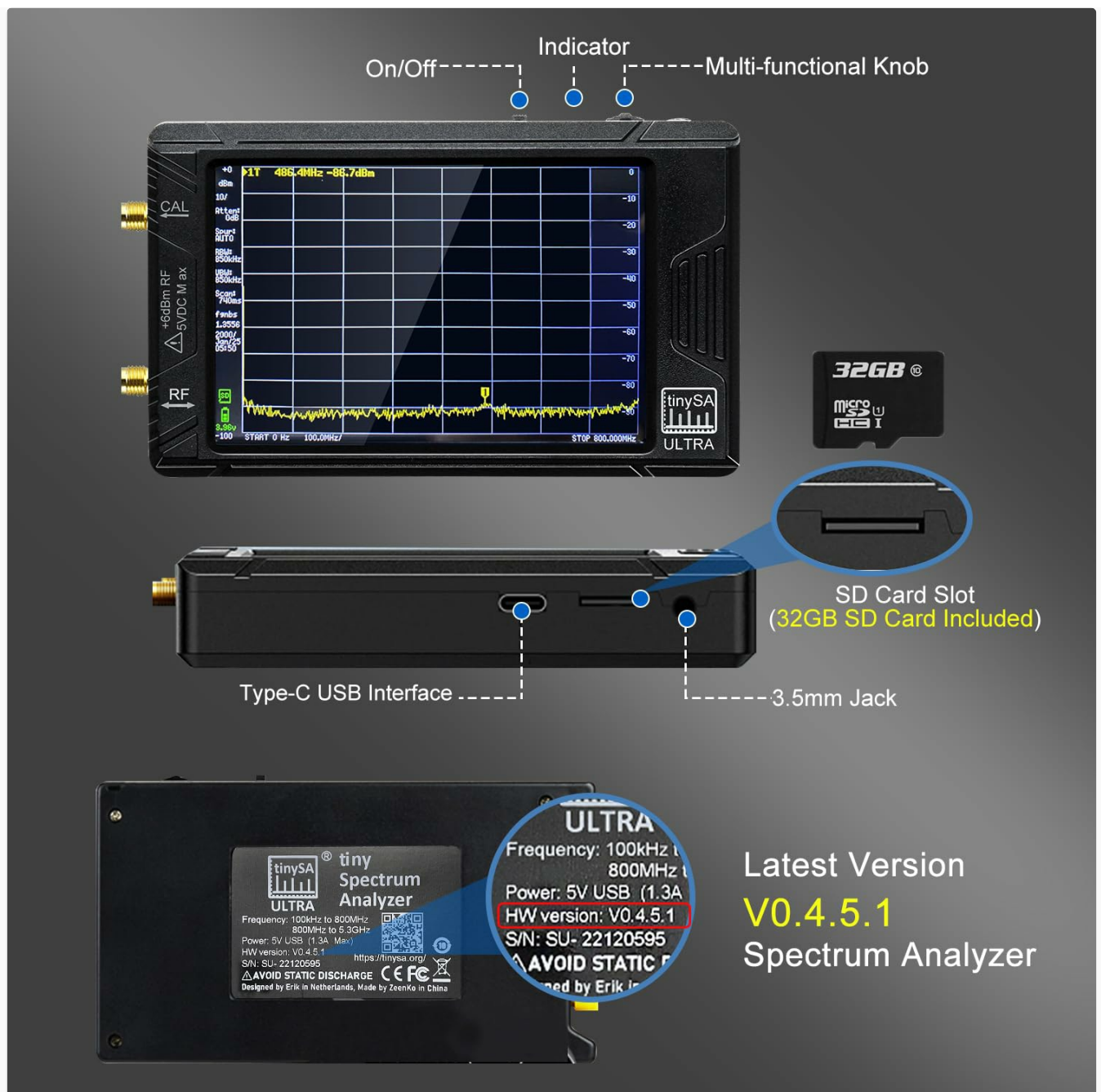


Image: A diagram of the TinySA Ultra, pointing out the On/Off button, indicator light, multi-functional knob, Type-C USB interface, 3.5mm Jack, and SD card slot.

The device features an intuitive layout with an On/Off button, an indicator light, a multi-functional knob for navigation, a Type-C USB interface for charging and data, a 3.5mm audio jack, and a convenient SD card slot for the included 32GB micro SD card.

SETUP

1. **Initial Charging:** Before first use, fully charge the TinySA Ultra using the provided USB-C cable. Connect it to a standard USB power adapter (not included) or a computer's USB port. The indicator light will show charging status.
2. **SD Card Installation:** The 32GB micro SD card is typically pre-installed. If not, gently insert it into the SD card slot until it clicks into place. Ensure the device is powered off before inserting or removing the SD card.
3. **Connecting Antennas/Cables:** For spectrum analysis, connect the appropriate antenna or RF cable to the "RF" input port. For signal generation, connect your load or measurement device to the "CAL" output port.
4. **Power On:** Press and hold the On/Off button until the screen illuminates.

OPERATING INSTRUCTIONS

Basic Navigation

- **Touchscreen:** Navigate menus and adjust settings by tapping on the 4-inch touch screen.
- **Multi-functional Knob:** Rotate the knob to scroll through options or adjust values. Press the knob to select an option or confirm a setting.

Spectrum Analyzer Mode

1. **Selecting Mode:** From the main menu, select "Spectrum Analyzer" mode.
2. **Setting Frequency Range:** Adjust the start and stop frequencies to define your desired measurement range. The device supports 100kHz to 5.3GHz.
3. **Resolution Bandwidth (RBW):** Configure the RBW (200Hz to 850kHz) to optimize for signal separation or scan speed. A lower RBW provides better frequency resolution but slower scans.
4. **LNA/DANL:** Utilize the Low Noise Amplifier (LNA) for measuring very weak signals. Be aware of the Device Average Noise Level (DANL) for the sensitivity limits.
5. **Measurements:** The screen will display the spectrum. Use markers to identify specific frequencies and power levels.

Signal Generator Mode

1. **Selecting Mode:** From the main menu, select "Signal Generator" mode.
2. **Output Type:** Choose between sine wave (100kHz-800MHz), square wave (800MHz-4.4GHz), or mixing signal (4.4GHz-5.4GHz).
3. **Frequency and Level Setting:** Set the desired output frequency and amplitude level using the touchscreen or multi-functional knob.
4. **Calibration Signal:** The built-in calibration signal generator can be used for self-testing and low input calibration.

PC Control

- **Connection:** Connect the TinySA Ultra to your computer using the USB-C cable.
- **Driver Installation:** For Windows, the driver should install automatically. For Linux, the driver is built into the kernel.
- **TinySA-APP:** Download and install the TinySA-APP from the official website (tinysa.org) for advanced control, display synchronization, and data transfer.

MAINTENANCE

- **Cleaning:** Use a soft, dry cloth to clean the device. Avoid abrasive cleaners or solvents.
- **Battery Care:** To prolong battery life, avoid fully discharging the device frequently. Store it with a partial charge if not used for extended periods.
- **ESD Protection:** The device has built-in ESD protection. However, always handle it with care and avoid static discharge, especially when connecting cables.
- **Software Updates:** Regularly check the official TinySA website (tinysa.org) for firmware updates to ensure optimal performance and access to new features.

TROUBLESHOOTING

- **Device Not Powering On:**
Ensure the battery is charged. Connect to a USB power source and try again. If the issue persists, contact support.

- **Inaccurate Readings:**

Perform a self-test and calibration as described in the device's on-screen menu or the TinySA-APP. Ensure correct antenna/cable connections and proper frequency range settings. Consider using external attenuators for high input signals to protect the device.

- **PC Connection Issues:**

Verify the USB-C cable is securely connected. Try a different USB port or cable. Ensure the TinySA-APP is the latest version and drivers are correctly installed on your operating system.

- **Difficulty Navigating Menus:**

Familiarize yourself with the multi-functional knob and touchscreen controls. Refer to online resources and community forums for detailed usage guides if needed, as the device has a significant learning curve for its advanced capabilities.

SPECIFICATIONS



SDRGEEK

TinySA Ultra Spectrum Analyzer

2 in 1 function Can be Signal Generator



100kHz-5.3GHz



ESD protection



4" Touch Screen



3000mAh Battery



**New
TinySA Ultra Mode**

Image: A comprehensive table outlining the technical parameters and specifications of the TinySA Ultra Spectrum Analyzer.

Parameter	Specification
Display size	4" TFT LCD (480x320)
Max low input frequency	800MHz, 6GHz in Ultra mode
Resolution filters in 1,3,10 steps	from 200Hz to 850kHz
Max output frequency	Sinus up to 800MHz, Square wave up to 4.4GHz
Output level	-104dBm to -16dBm
Ultra mode	Level calibrated up to 5.3GHz
Internal LNA gain	20dB up to 4GHz
Displayed points per scan	max 450
0-350MHz scan time	165ms
Shortest zero span time	17ms

Parameter	Specification
DANL at 100MHz	-153dBm/Hz (LNA Off), -169dBm/Hz (LNA On)
DANL degrading in ultra mode	10dB above 2.5GHz, 25dB above 5.3GHz
Phase noise at 10kHz offset	-92dBc/Hz
Phase noise at 100kHz offset	-110dBc/Hz
Input 1dB compression level	+0.5dBm (LNA Off) / -26.5dBm (LNA On)
IIP3 without LNA	+18dBm (at least 2MHz apart) / 0dBm (500Hz apart)
IIP3 with LNA	8dBm (at least 2MHz apart)
Frequency stability	<1ppm (-10°C ~ +55°C)
SD card slot	micro SD card
Audio out	3.5mm headphone plug
FW update mode activation	Push jog button before switch on
Maximum current consumption	330mA
Maximum charging current	1300mA
Battery	Li-Polymer 3.7V 3000mAh
RF connectors	SMA female
Communication Interface	USB-CDC(Type-C), UART-TTL(2.54mm Connector)

WARRANTY AND SUPPORT

SDRGEEK provides comprehensive after-sales support for its products. The TinySA Ultra comes with up to one year of after-sales support, covering product installation, usage guidance, and troubleshooting.

For further assistance, technical inquiries, or to check for the latest firmware updates and software, please visit the official TinySA website: tinysa.org. You can also visit the [SDRGEEK Amazon Store](#) for product information and customer service.

ASK A QUESTION ABOUT THIS MANUAL

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

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

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