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› AURSINC TinySA Ultra+ ZS406 Spectrum Analyzer User Manual

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Model: TinySA Ultra+ ZS406

1. INTRODUCTION

The AURSINC TinySA Ultra+ ZS406 is a compact, handheld spectrum analyzer and signal generator designed for a wide range of RF applications. This device features a 4.0-inch touchscreen, a broad frequency range, and PC control capabilities, making it suitable for both hobbyists and professionals.

This manual provides essential information for the proper setup, operation, and maintenance of your TinySA Ultra+ ZS406.

2. PACKAGE CONTENTS

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

- 1x TinySA Ultra+ ZS406 Spectrum Analyzer (with built-in 5000mAh rechargeable battery)
- 1x 32GB Micro SD card (pre-installed in the device)
- 2x 30cm ALSR100 SMA cables
- 1x USB Type-C data cable
- 1x SMA-SMA barrel connector
- 1x Antenna with SMA connector
- 1x Lanyard and touch plectrum
- 1x Stylus pen



Image: The TinySA Ultra+ ZS406 device and all included accessories laid out.

3. SETUP

3.1 Initial Charging

Before first use, fully charge the device using the provided USB Type-C cable. Connect the cable to the device's Type-C port and a standard USB power source. The built-in 5000mAh battery provides at least 3 hours of continuous operation on a full charge.

Built-in 5000mAh Rechargeable Battery



Type-C
Port

8 Hours
Working Time

Image: The TinySA Ultra+ ZS406 connected to a laptop via USB-C cable for charging.

3.2 Micro SD Card

The device comes with a pre-installed 32GB micro SD card for storing measurements, settings, traces, and screen captures. Ensure it is properly seated before operation.

Built-in **32GB** Micro SD Card

Convenient for storing measurements, settings, traces and screen captures, solving the on-site data storage issue effectively

Up to 32GB



Image: Close-up of the TinySA Ultra+ ZS406 showing the micro SD card slot and a 32GB card.

3.3 Antenna Connection

Attach the included antenna or an appropriate external antenna to the RF input connector for spectrum analysis. Use the provided SMA cables and barrel connector as needed for your setup.

4. OPERATING INSTRUCTIONS

4.1 Power On/Off

Press and hold the power button located on the side of the device to turn it on or off.

4.2 Touchscreen Interface

The 4.0-inch 480x320 touchscreen display allows for intuitive operation. Use your finger or the provided stylus pen/plectrum to navigate menus and adjust settings.

4.0 inch Resistive TouchScreen

Larger View for Intuitive Operation & Clear Signal Visualization



Image: A hand interacting with the 4.0-inch touchscreen of the TinySA Ultra+ ZS406.

4.3 Spectrum Analyzer Function

The device operates as a spectrum analyzer with a frequency range of 100kHz to 5.4GHz. In Ultra mode, it extends up to 6GHz. Key features include:

- **Resolution Bandwidth (RBW):** Switchable from 200Hz to 850kHz for precise or fast measurements. A 200Hz minimum RBW supports SSB two-tone intermodulation testing.
- **Input Attenuator:** Includes a 0-31dB input step attenuator.
- **Low Noise Amplifier (LNA):** An integrated LNA provides 20dB of extra gain for low-level signals (effective below 3.5GHz).
- **Phase Noise Performance:** -108dB/Hz at 100kHz offset and -115dB/Hz at 1MHz offset (at 30MHz).
- **Displayed Points:** Displays up to 450 points for gapless full-band coverage.

100kHz - 5.4GHz

Wide Frequency Range for Versatile Testing

NORMAL MODE
100 KHz-900 MHz

ULTRA MODE
5.4 GHz



Image: The TinySA Ultra+ ZS406 displaying a spectrum analysis with a wide frequency range from 100kHz to 5.4GHz.

4.4 Signal Generator Function

The TinySA Ultra+ ZS406 also functions as a signal generator:

- **MF/HF/VHF Sine Waves:** Outputs from 100kHz to 900MHz.
- **UHF Square Waves:** Outputs from 800MHz to 4.4GHz.
- **Mixed Signals:** Outputs from 4.4GHz to 5.4GHz.

2-in-1 Function

Spectrum Analyzer

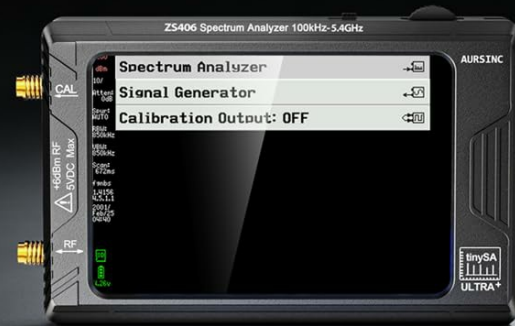
1

100KHz - 900MHz

High Performance

Up to 5.4GHz

ULTRA Mode



Signal Generator

2

100KHz - 900MHz

MF/HF/VHF Sinus Output

900MHz - 4.4GHz

UHF Square Wave Output

4.4GHz - 5.4GHz

Mixing signal output



Image: The TinySA Ultra+ ZS406 displaying its dual functionality as both a spectrum analyzer and a signal generator.

4.5 PC Control

Connect the device to a PC via USB for data transfer and control using the TinySA-APP. The Serial over USB (CDC) protocol provides a full command set for measurements and internal settings. Drivers install automatically on Windows and are natively built into the Linux kernel.

PC Software Control Available

Tinysa-App Control | Transfer Data & Sync display to PC



Image: A user operating the TinySA Ultra+ ZS406 connected to a computer running PC software for data analysis.

5. MAINTENANCE

5.1 Battery Care

To prolong battery life, avoid fully discharging the device frequently. Recharge the 5000mAh battery when the charge level is low. Store the device in a cool, dry place when not in use for extended periods.

5.2 Calibration

The TinySA Ultra+ ZS406 includes a built-in calibration signal generator that supports automatic self-test and low-input calibration. Regular calibration ensures sustained measurement accuracy. Refer to the device's on-screen menu for calibration options.

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5.3 Software Updates

Ensure your device runs on the latest firmware (HW V0.4.6 or newer) for optimal performance and features. Check the official AURSINC website or community forums for update instructions.

6. TROUBLESHOOTING

If you encounter issues with your TinySA Ultra+ ZS406, consider the following:

- **Device not powering on:** Ensure the battery is charged. Connect to a USB power source and try again.
- **No signal detected:** Verify that the antenna or RF input cable is securely connected. Check the frequency range settings to ensure they cover the expected signal.
- **PC connection issues:** Ensure the USB Type-C cable is properly connected. Restart the TinySA-APP on your computer. For Windows, drivers should install automatically; for Linux, they are natively built into the kernel.
- **Inaccurate readings:** Perform a calibration using the built-in signal generator. Check for external interference or proper grounding.

For further assistance, refer to the official AURSINC support resources or community forums.

7. SPECIFICATIONS

Parameter	Value
Display Size	4.0 inch TFT LCD (480x320)
Frequency Range (Spectrum Analyzer)	100kHz - 5.4GHz (Ultra mode up to 6GHz)
Resolution Bandwidth (RBW)	200Hz - 850kHz
Signal Generator Output	Sine wave: 100kHz - 900MHz; Square wave: 800MHz - 4.4GHz; Mixed: 4.4GHz - 5.4GHz
Internal LNA Gain	20dB (up to 4GHz)
Input Step Attenuator	0-31dB
Phase Noise @ 100kHz offset	-108dBc/Hz
DANL @ 100MHz	-153dBm/Hz (LNA Off) / -169dBm/Hz (LNA On)
Battery	5000mAh Lithium Polymer
PC Interface	USB-CDC (Type-C)
Dimensions	4.61 x 2.83 x 0.91 inches
Item Weight	13.4 ounces

Parameter	Value
Hardware Version	V0.4.6

8. WARRANTY AND SUPPORT

8.1 Warranty Information

AURSINC provides a 365-day warranty for this product. For specific details regarding exchanges or returns, please refer to your purchase documentation or contact AURSINC customer service.

8.2 Customer Support

For any questions or concerns regarding your TinySA Ultra+ ZS406, AURSINC customer service is available to assist you. You can typically expect a response within 24 hours.

Visit the [AURSINC Store](#) for additional product information and support resources.

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