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### Cloudpower SA5

# Cloudpower SA5 Handheld Spectrum Analyzer User Manual

Model: SA5

## 1. Product Overview

The Cloudpower SA5 is a versatile handheld device designed for both spectrum analysis and signal generation. It features a 4-inch IPS LCD display and an intuitive rotary knob for operation. This device is suitable for engineers and hobbyists requiring portable frequency analysis and signal output capabilities.

**Key Features:**

- **Display:** 4-inch HD IPS LCD for clear data visualization.
- **Spectrum Analyzer:** Frequency range from 0.1MHz to 800MHz in normal mode, extending up to 5.3GHz with level calibration in Ultra mode, and signal monitoring up to 12GHz.
- **Signal Generator:** Outputs sine waves (0.1-800MHz), square waves (up to 4.4GHz), and RF test signals (up to 5.3GHz).
- **Battery:** Built-in 5000mAh rechargeable battery providing approximately 10 hours of portable use.
- **Storage:** MicroSD card slot for saving measurement data, settings, and screenshots.
- **Connectivity:** USB Type-C for charging and PC connection, enabling PC-controlled operation.
- **Resolution Bandpass Filter:** Adjustable from 200Hz to 850kHz.
- **Input Attenuator:** Step-adjustable from 0dB to 31dB (not compatible with LNA).
- **Optional LNA:** Built-in 20dB Low Noise Amplifier.
- **Calibration:** Includes a built-in calibration signal generator for automatic self-test and input calibration.




Figure 1: SA5 Handheld Spectrum Analyzer and its accessories, including RF cables, antenna, and USB cables.



Figure 2: Overview of SA5 product features, including screen size, spectrum analyzer modes, signal generator capabilities, and battery life.

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Video 1: Demonstration of the SA5 Handheld Spectrum Multi-Function Harmonic Analyzer in operation, showcasing its display and various functions.

## 2. Components and Controls

The SA5 unit consists of the main device and several accessories. Familiarize yourself with the components before operation.

### 2.1. Main Unit Features

- **IPS LCD Display:** The primary interface for viewing measurements and settings.
- **Rotary Knob:** Used for navigation, selection, and adjusting parameters.
- **Power Button:** Located on the side for turning the device on and off.
- **RF Input/Output Ports:** Connect RF cables and antennas for signal analysis or generation.

- **CAL Port:** For calibration purposes.
- **Type-C Interface:** For charging and connecting to a PC.
- **3.5mm Jack:** For audio output or other auxiliary connections.
- **MicroSD Card Slot:** For data storage.

## 2.2. Included Accessories

- Type-C data cable (x1)
- 30cm RG405 SMAJB2/SMAJB2 RF cables (x2)
- SMA-to-SMA connector (x1)
- Antenna with SMA connector (x1)
- Lanyard touch sheet (x1)
- Touch pen (x1)
- 32GB MicroSD card (pre-inserted, x1)




Figure 3: Detailed views of the SA5, highlighting the display, rotary knob, and various connection points.




Figure 4: Bottom panel of the SA5, illustrating the Type-C charging port, MicroSD card slot, and 3.5mm audio jack.

# 3. Initial Setup

## 3.1. Charging the Device

1. Connect the provided Type-C data cable to the SA5's Type-C port.
2. Connect the other end of the cable to a compatible USB power adapter (not included) or a computer's USB port.
3. The device will indicate charging status on the display. A full charge provides approximately 10 hours of operation.

## 3.2. Powering On/Off

- **To Power On:** Press and hold the power button located on the side of the device until the display illuminates.
- **To Power Off:** Press and hold the power button until the shutdown prompt appears, then confirm.

## 3.3. MicroSD Card Installation

The SA5 comes with a 32GB MicroSD card pre-inserted. If you need to replace or re-insert the card:

1. Locate the MicroSD card slot on the bottom of the device.
2. Gently push the existing card to eject it, or insert a new card with the contacts facing down until it clicks into place.

### 3.4. Connecting RF Accessories

For spectrum analysis or signal generation, connect the appropriate RF cables and antenna to the RF ports on the device. Ensure connections are secure.

## 4. Operating Instructions

The SA5 offers two primary modes of operation: Spectrum Analyzer and Signal Generator. Use the rotary knob and touch screen for navigation and parameter adjustment.

### 4.1. Spectrum Analyzer Mode

In this mode, the SA5 measures and displays the frequency spectrum of input signals.

- **Frequency Range:** The device operates from 0.1MHz to 800MHz. Activate "Ultra mode" to extend the range up to 5.3GHz with level calibration, and monitor signals up to 12GHz.
- **Resolution Bandpass Filter (RBW):** Adjust the RBW from 200Hz to 850kHz to control the frequency resolution and noise floor.
- **Input Attenuator:** Use the step attenuator (0dB to 31dB) to prevent signal overload. Note that the attenuator cannot be used simultaneously with the Low Noise Amplifier (LNA).
- **Optional LNA:** The built-in 20dB LNA can be enabled to amplify weak signals.
- **Spectrum Display:** The display can show up to 450 points and supports up to 4 independently configured trace curves for detailed analysis.

### 4.2. Signal Generator Mode

When not used as an analyzer, the SA5 can generate various test signals.

- **Sine Waves:** Output sine waves from 0.1MHz to 800MHz.
- **Square Waves:** Generate square waves up to 4.4GHz.
- **RF Test Signals:** Output RF test signals up to 5.3GHz.

### 4.3. Calibration

The SA5 includes a built-in calibration signal generator. This allows for automatic self-testing and input calibration to ensure measurement accuracy. Refer to the on-screen menu for calibration procedures.

### 4.4. Data Storage and PC Connection

- **Data Storage:** Measurement data, device settings, and screenshots can be saved directly to the inserted MicroSD card.
- **PC Connection:** Connect the SA5 to a computer via the USB Type-C cable. The device can function as a PC-controlled spectrum analyzer or signal generator, and allows for convenient data transfer.




Figure 5: SA5 display showing spectrum analysis, with annotations pointing to features like the resolution bandpass filter, optional LNA, storage, spectrum display, input attenuator, and calibration.

# 5. Maintenance

## 5.1. Cleaning

- Wipe the device exterior with a soft, dry cloth.
- For stubborn dirt, use a slightly damp cloth with mild soap, then wipe dry immediately.
- Do not use abrasive cleaners, solvents, or harsh chemicals, as these can damage the display and casing.

## 5.2. Battery Care

- Avoid fully discharging the battery frequently.
- Charge the device regularly, even if not in use, to maintain battery health.
- Store the device in a cool, dry place when not in use for extended periods.

### 5.3. Storage

When storing the SA5, ensure it is powered off and kept in a protective case to prevent physical damage. Avoid extreme temperatures and high humidity.

## 6. Troubleshooting

### 6.1. Device Does Not Power On

- Ensure the battery is charged. Connect the device to a power source using the Type-C cable and allow it to charge for at least 30 minutes.
- Verify that the power button is pressed and held correctly.

### 6.2. Display Issues

- If the display is dim, check the brightness settings in the device menu.
- If the screen is unresponsive, try restarting the device.

### 6.3. Inaccurate Readings

- Perform a calibration using the built-in calibration signal generator (refer to Section 4.3).
- Ensure RF cables and connectors are securely attached and not damaged.
- Check the input attenuator settings to prevent signal overload.
- Verify that the correct frequency range and resolution bandwidth are selected for your measurement.

### 6.4. PC Connection Issues

- Ensure the Type-C cable is properly connected to both the SA5 and the computer.
- Verify that the necessary drivers (if any) are installed on your computer.
- Try a different USB port or cable.

## 7. Technical Specifications

| Feature | Specification |
|---|---|
| Display | 4-inch HD IPS LCD |
| Spectrum Analyzer Frequency Range (Normal) | 0.1MHz - 800MHz |
| Spectrum Analyzer Frequency Range (Ultra Mode) | Up to 5.3GHz (with level calibration), up to 12GHz (monitoring) |
| Signal Generator Output (Sine Wave) | 0.1MHz - 800MHz |
| Signal Generator Output (Square Wave) | Up to 4.4GHz |
| Signal Generator Output (RF Test Signal) | Up to 5.3GHz |
| Resolution Bandpass Filter (RBW) | 200Hz - 850kHz |
| Input Attenuator | 0dB to 31dB (step adjustable) |
| Low Noise Amplifier (LNA) | Built-in 20dB (optional) |

| Feature | Specification |
|---|---|
| Battery Capacity | 5000mAh rechargeable |
| Battery Life | Approximately 10 hours |
| Storage | MicroSD card slot (32GB card included) |
| Connectivity | USB Type-C |
| Product Dimensions | 163.5mm x 92mm x 42mm (6.44 x 3.62 x 1.65 inches) |
| Item Weight | 1.22 pounds (approx. 553g) |
| Manufacturer | Cloudpower |
| Item Model Number | 1OHX6TFYVTEBJW9HR4KR92 |

# 8. Warranty and Support

## 8.1. Warranty Information

This product is covered by a standard manufacturer's warranty. Please retain your proof of purchase for warranty claims. Specific warranty terms and duration may vary by region and retailer. For detailed warranty information, please refer to the documentation provided at the time of purchase or contact customer support.

## 8.2. Customer Support

For technical assistance, troubleshooting, or inquiries regarding your Cloudpower SA5 Handheld Spectrum Analyzer, please contact your retailer or the manufacturer's customer support. Contact information can typically be found on the product packaging or the manufacturer's official website.

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