ZX8601 Series

Sound Calibrator

User Manual

Copyright

FCC Caution

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interference, and

2) This device must accept any interference received, including interference that may cause undesired operation. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*

- *Increase the separation between the equipment and receiver.*

- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*

- *Consult the dealer or an experienced radio/TV technician for help.*

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Health and Safety Consideration

This apparatus has been designed and tested in accordance with IEC/EN 61010 – 1. This manual contains information and warnings that must be followed to ensure safe operation and to retain the apparatus in a safe condition.

Safety Usage Consideration

When using the ZX3300 Sound Level Analyzer, it is crucial to adhere to safety guidelines to prevent fire hazards or personal injury. Ensure that you fully read and understand the safety notice before use. Always operate the device only for its intended purpose and refrain from unauthorized disassembly, as tampering may lead to malfunctions or unsafe conditions. If the device begins to overheat or show signs of malfunction, immediately cease operation to avoid potential risks. For any required repairs, always contact ZXONIC rather than attempting fixes yourself. Additionally, keep the device away from heat sources, open flames, or high-temperature areas to ensure safe and optimal acoustic performance.

Limited Warranty & Limitation of Liability

ZXONIC made every effort to ensure the accuracy of the information contained in this document. No responsibility is accepted for any errors or omissions herein. It is the responsibility of the user to ensure compliance with any legal or statutory requirements in the country of use. Data and legislation may change; therefore, users are advised to obtain copies of the most recently issued applicable regulations, standards, and guidelines.

The ZX3300 Multifunctional Sound Level Meter is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is two (2) years from the date of shipment. Parts, product repairs, and services are warranted for ninety (90) days. This warranty is limited to the original purchaser and is not applicable to fuses or any product that, in ZXonic's sole discretion, has been subjected to misuse, alteration, neglect, contamination, accidental damage, or abnormal conditions of operation or handling.

ZXonic warrants that the software will operate substantially in accordance with its functional specifications for a period of ninety (90) days and that it has been properly recorded on non-defective media. ZXonic does not warrant that the software will be error-free or uninterrupted.

Warranty support is available solely for products purchased through ZXonic. ZXonic reserves the right to charge the buyer for costs related to repair or replacement parts.

ZXonic's warranty obligation is limited, at its discretion, to either a refund of the purchase price, free repair, or replacement of a defective product returned to ZXonic within the warranty period. To obtain warranty service, the buyer must contact ZXonic for return authorization and then send the product along with a description of the issue, postage, and insurance prepaid (FOB Destination). ZXonic assumes no responsibility for damage during transit.

Upon completion of warranty repair, the product will be returned to the buyer, transportation prepaid (FOB Destination). If ZXonic determines that the failure resulted from neglect, misuse, contamination, alteration, accident, abnormal operating conditions, overvoltage failure outside the specified rating, or normal wear and tear of mechanical components, ZXonic will provide an estimate of repair costs and seek authorization before proceeding with repairs. Following repairs, the product will be returned to the buyer, prepaid transportation, and the buyer will be responsible for payment of the repair costs and return shipping charges (FOB Shipping Point).

THIS WARRANTY SHALL CONSTITUTE THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ZXONIC SHALL NOT BE LIABLE FOR ANY SPECIAL, DIRECT OR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF DATA, ARISING FROM ANY CAUSE OR THEORY OF LIABILITY.

Some jurisdictions do not permit limitations on the duration of implied warranties or the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to all buyers. If any provision of this warranty is held to be invalid or unenforceable by a court or other competent authority, such holding shall not affect the validity or enforceability of the remaining provisions.

Revision History

Revision	Description	Revision Date
V 1.0	Initial Release	July 2025
V 1.1	Fix Error	December 2025

Content

1 Overview

With advancements in technology, acoustic devices are evolving towards greater intelligence, diversity, and ease of use. The ZX8601 Series Sound Calibrators has been developed in response to to meet these demands.

The ZX8601 Sound Calibrator is primarily used for calibrating the sound pressure sensitivity of test microphones and acoustic measuring instruments. It is **compact, lightweight, stable in performance, and easy to use**. Its performance complies with the requirements for Class 1 sound calibrators as specified in **IEC 60942: 2003.**

The ZX8601 series includes:

1) ZX8601: A Class 1 sound calibrator with a single frequency point and single sound pressure level at 94 dB and 1 kHz

2) ZX8601-D4: A Class 1 sound calibrator with a single frequency point at multiple(4) sound pressure levels at 94/104/114/124 dB and 1 kHz.

3) ZX8601-M3: A Class 1 sound calibrator with multiple(3) frequency points at a single sound pressure level at 94 dB and 250/500/1k Hz.

2 Main Technical Specifications

1) Compliance Standards

    a. IEC 60942:2003

    b. ANSI S1.40-2006

2) Frequency and Sound Pressure Level:

Model	Frequency (Hz)	Sound Pressure Level (dB)
ZX8601	1k	94 or 114
ZX8601-D4	1k	94, 104, 114, 124
ZX8601-M3	250, 500, 1k	94

Note 1: The exact frequency values are based on ISO 266:1997 Table 1; see Appendix A for details.)

Note 2: (The nominal frequency values are taken from ISO 266:1997 Table 1; see Appendix A for details.)

Note3: The displayed frequency on the instrument corresponds to the nominal frequency.

3) Sound Pressure Level Tolerance: ± 0.25 dB

4) Harmonic Distortion: ≤ 1.5%

5) Total Distortion: ≤ 2.5%

6) Operating Voltage Range: 3 V -5 V

7) Battery: 3.7V lithium-polymer battery; Fully charges in 3 hours

8) Continuous operation time: 5 hours

9) Stabilization Time: ≤ 15 seconds

10) Dimensions: 58 × 58 × 57 mm (L × W × H)

11) Weight: 172 g

12) Operating Conditions:

    a. Temperature: - 10 °C to +50 °C

    b. Relative Humidity: 25% – 90%

    c. Atmospheric Pressure: 65 kPa – 108 kPa

3 Structural Features
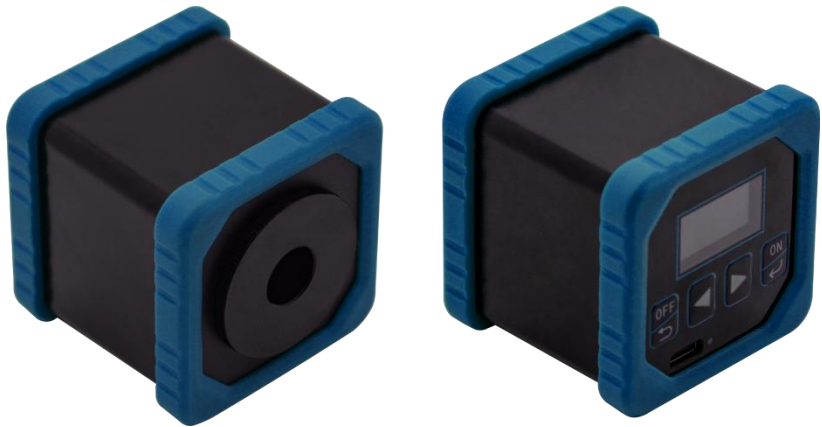

Figure 3.1 ZX 8601 Sound Calibrator

Power Off

Confirm

USB Port

Charging
Indicator Light

Decrease

Increase
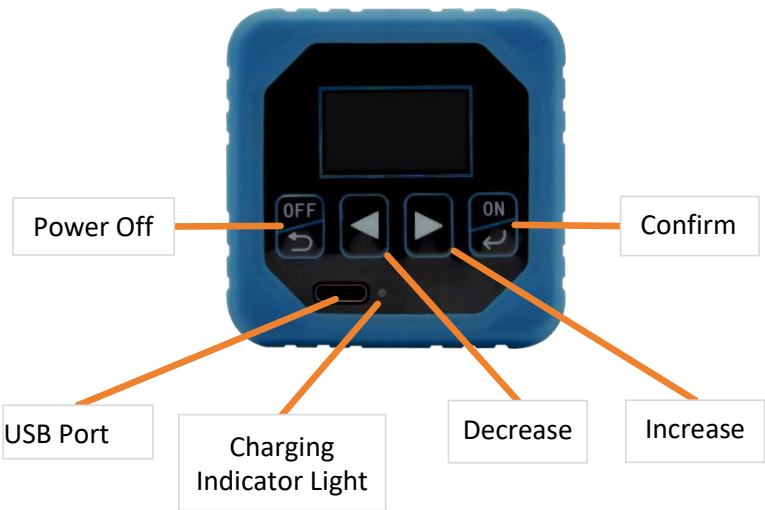
Figure 3.2 Front Structure

Figure 3.3 Back Structure

4 Operation and Maintenance

4.1 Usage Instructions

For the **ZX8601** (Single Frequency, Single Sound Pressure Level Configuration):

➢ **Power On:** The device uses an LED display panel. Press and hold the "⌨" button to turn it on, entering preparation mode.

➢ **LED Indicators:** The work indicator light will flash, and the corresponding frequency indicator light remains steady as shown in Figure X.

➢ **Automatic Calibration Mode:** Once the device detects a microphone and the generated sound has stabilized, the device enters calibration mode, with the work indicator light turning steady as shown in Figure X.

For the**ZX8601-D4** (Single Frequency, Multiple Sound Pressure Levels Configuration):

➢ **Power On:** Press and hold the "⌨" button to turn on the device, entering the working interface as shown in Figure X.

➢ **Sound Pressure Level Selection:** Use the "▶" and "◀" buttons to switch sound pressure levels.

➢ **Ready Mode:** Press "⌨" again to enter preparation mode, with blue text "Ready" at the bottom of the LCD as shown in Figure X.

➢ **Calibration Mode:** Once the device detects a microphone and the generated sound has stabilized,, the device enters calibration mode, turning the blue "Ready" text green to display "Calibrating" as shown in Figure X.

For the **ZX8601-M3** (Multi-Frequency, Single Sound Pressure Level Configuration):

➢ **Power On:** Press and hold the "⌨" button to turn on the device. The system enters the working interface as shown in Figure X.

➢ **Frequency Selection:** Use the "▶" and "◀" buttons to switch between frequencies.

➢ **Ready Mode**: Press "⌨" again to enter ready mode, indicated by blue text "Ready" at the bottom of the LCD ash shown in Figure X.

➢ **Calibration Mode**: Once the device detects a microphone and the generated sound has stabilized, it switches to calibration mode, and the blue "Ready" text turns green, displaying "Calibrating" as shown in Figure X.

4.2 Manual/Automatic Power-Off Function

Manual Power-Off:

➢   After calibration, press "⌷" to exit calibration mode and return to working mode.

➢   Press "⌷" again to turn off the device.

Automatic Power-Off:

After calibration, remove the microphone from the coupler, leaving the calibrator's output port open.

The sound calibrator will automatically turn off after approximately 2 minutes.

4.3 Equivalent Free-Field Sound Pressure Level

The **ZX8601** series calibrators come in different configurations. When calibrating free-field microphones (used in sound level meters and environmental noise measurement instruments), corrections should be applied.

The correction value corresponds to the difference between the sound pressure response and the free-field response at 1000 Hz:

For Ø23.77 mm (1-inch) microphones: -0.4 dB

For Ø12.7 mm (1/2-inch) microphones: -0.2 dB

4.4 Battery Level Indicator

1)   The ZX8601 series uses a rechargeable built-in soft-pack lithium battery.

2)   Low Battery Warning: If the battery icon at the bottom-left corner of the LCD turns red, the battery is low.

3)   Use a Type-C charging cable to connect the charger.

4)   Charging Status:

   a.   Red charging indicator: Charging in progress.

   b.   Green charging indicator: Fully charged.

4.5 Regular Calibration Standards

The sound calibrator should be regularly calibrated (e.g., once per year) by authorized metrology departments to ensure accurate sound pressure levels.

Appendix A: Common Frequencies in Acoustic Measurements

Nominal Frequency (Hz)	Exact Frequency (Hz)	Nominal Frequency (Hz)	Exact Frequency (Hz)
20	19.9526	1000	1000
25	25.1189	1250	1258.93
31.5	31.6228	1600	1584.89
40	39.8107	2000	1995.26
50	50.1187	2500	2511.89
63	63.0957	3150	3162.28
80	79.4328	4000	3981.07
100	100	5000	5011.87
125	125.893	6300	6309.57
160	158.489	8000	7943.28
200	199.526	10000	10000
250	251.189	12500	12589.3
315	316.228	16000	15848.9
400	398.107		
500	501.187		
630	630.957		
800	794.328		