CRYSOUND

CRY2833 & CRY2834

Sound Level Meters

User Manual

Warranty Statement

We proudly offer a two-year warranty on the CRY2833 & CRY2834 Sound Level Meters, ensuring it meets the highest standards of quality and performance. This warranty covers defects in materials and workmanship under normal use.

Coverage Details:

- Warranty Period: Two years from the date of purchase.
- What's Covered: Defects in materials or workmanship that occur under normal use.
- What's Not Covered: Damage caused by misuse, unauthorized modifications, accidents, or external factors.

To request a warranty service, please contact our customer support team with your proof of purchase. We will repair or replace the device at our discretion.

Contact Us

Hangzhou Headquarters

Tel: +86-571-88225128

E-mail: info@crysound.com

Add: No. 10 Xianqiao Rd, Yuhang Dist, Hangzhou, China

Web: www.crysound.com

U.S. Office

Add: 515 S Fry Rd, Suite A-221, Katy, TX 77450, USA

Tel: +1-877-215-7752

Safety Use Instructions

To prevent possible fire or personal injury:

- Please read the contents of this safety notice carefully before using the product.
- Use the product only for its intended purpose.
- Unauthorized opening of the unit will void the warranty. Contact CRYSOUND for more information.
- Stop using the device if it malfunctions or heats up abnormally.
- Please contact the manufacturer for equipment repair work.
- Do not store the equipment near heat sources, flames or in a hot environment.
- If the storage time is longer than 1 month, please store the product at an ambient temperature of less than 40 ℃ / 140 ℉.

Catalog

Revision History

Revision number	Description	Revision date
1.0	● Initial version	2025/08/10

1 Introduction

1.1 About This Manual

This user manual describes the CRY2833 & CRY2834 Sound Level Meters and is divided into the following sections:

- Introduction
- Technical Specifications
- Instructions For Use
- Appendix

1.2 About the CRY2833 & CRY2834

CRY2833 & CRY2834 sound level meters meet the stringent requirements of Class 1 and Class 2 ensuring accurate and reliable acoustic measurements. Functions such as statistical analysis, data logging, wireless control and transmission are included.

The CRY2833 & CRY2834 sound level meters' design balances esthetics and ergonomics. They feature a 2.8 inch high-resolution, color TFT display and simple ergonomic controls. Data can be stored on an internal microSD memory card for easy transfer to external analysis systems.

2 Technical Specifications

Technical Specifications

Type	CRY2834	CRY2833
Microphone	CRY331 (-28±2 dBV/Pa)	CRY333 (-26±2 dBV/Pa)
Pre-amplifier	CRY2830PA-1	
Linear Range	@ 1 kHz: 25-140 dBA @ 31.5 Hz: 25-101 dBA @ 4k Hz: 25-141 dBA @ 8k Hz: 25-138 dBA @ 12.5k Hz: 25-133 dBA	@ 1 kHz: 25-140 dBA @ 16 Hz: 25-83 dBA @ 31.5 Hz: 25-101 dBA @ 4k Hz: 25-141 dBA @ 8k Hz: 25-138 dBA @ 12.5k Hz: 25-133 dBA @ 16k Hz: 25-127 dBA
Time Weighting	F, S, I	
Frequency Weighting	A, C, Z	
Sampling Rate	48k Hz	
A/D Resolution	24 - bit	
Frequency Range	20 Hz - 12.5k Hz	10 Hz - 20k Hz
Applicable Standards	IEC 61672-1:2013 Class 2	IEC 61672-1:2013 Class 1
Measuring Parameter	Lp, Leq,t, Lpeak, Leq,T, Lmax, Lmin, LN (N=5, 10, 50, 90, 95), SD	

Measurement Function	Integrating, Statistical Analysis, 1/1 Oct, 1/3 Oct
Display	320 × 240 TFT Display
Battery	4 × AA
Operating Time	24 hours (Screen off)
Interface	AC/DC, USB-C, RS232, BT/WiFi or GPS (Select one)
Memory	32 GB microSD card
Reference Level	94dB @ 1k Hz / 114dB @ 1k Hz
Calibration	Sound Calibrator Class 1 or Class 2
External Power Supply	5V DC, 5V USB-C, 4 × AA battery
Operating Temperature Range	-20 to +60 ℃
Humidity Range	≤ 90% RH
Weight	330 g
Size	L × W × H = 249 × 76 × 30.5mm
Operation	Button

Note:

1 Please do not use an external power supply exceeding 6 V, as it may damage the equipment.

2 If you need the timekeeping function when power off, please install a CR2016 button battery.

3 Instructions For Use

3.1 Icon and Interface Illustration

Button

			
Arrow Key (up)	Arrow Key (down)	Arrow Key (left)	Arrow Key (right)
			
Power Key	Confirm Key	Return Key	Recording Key

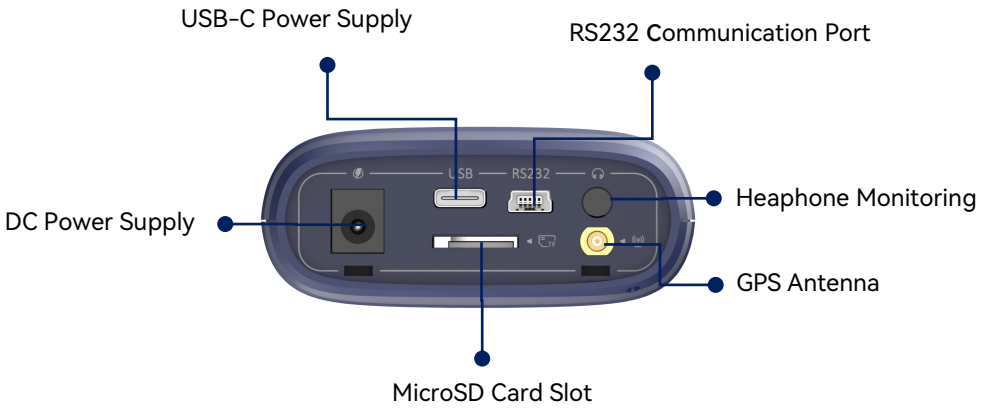
Main Interface

			
SLM APP	Calibration APP	Settings APP	Statistics APP
			
1/1 OCT APP	、1/3 OCT APP	、	、

Settings

			
WiFi	Bluetooth	Display Settings	Storage
			
Date & Time	Language	About	Analog Output

Function App			
			
Main Interface	Secondary Interface	Settings	Start Test
			
Testing	Pause Test	Mode Settings	Data
			
Record	Print	Delete	



3.2 Preparations

1) Check whether the microphone and the preamplifier are properly installed.

2) Check whether the battery is sufficiently charged.

3) If necessary, use a sound calibrator to calibrate the sound level meter before using.

4) The sound level meter should be regularly (e.g., once a year) sent to a calibration department for verification to ensure its accuracy.

3.3 Power On

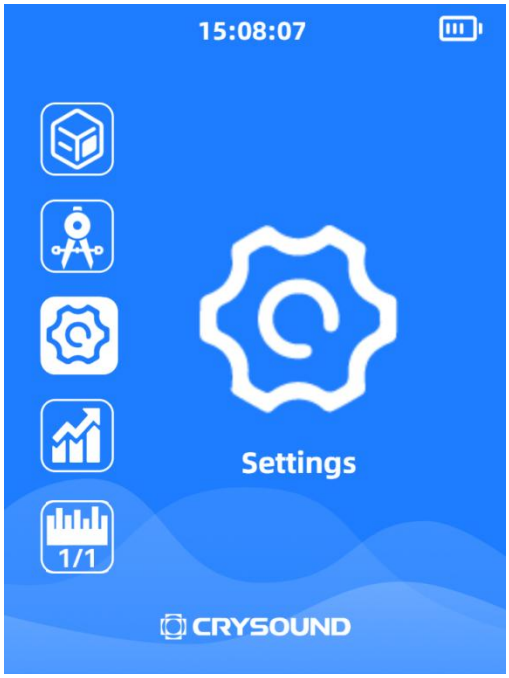
1) Before official use, install four new AA batteries to ensure the device operates normally during measurements.

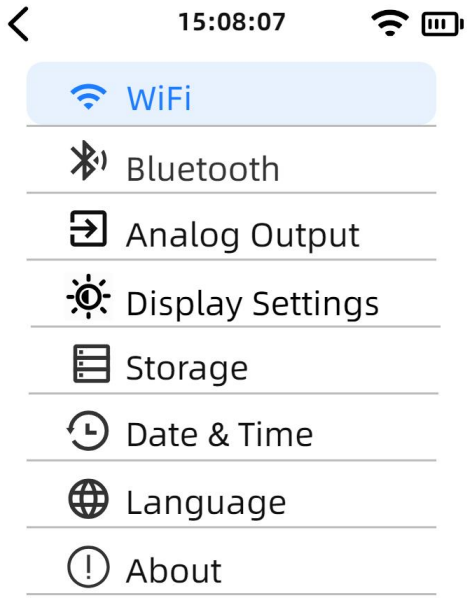
2) Press the power button for 3 to 5 seconds until the startup animation appears on the screen. The screen will then display the measurement main interface.

3.4 Settings

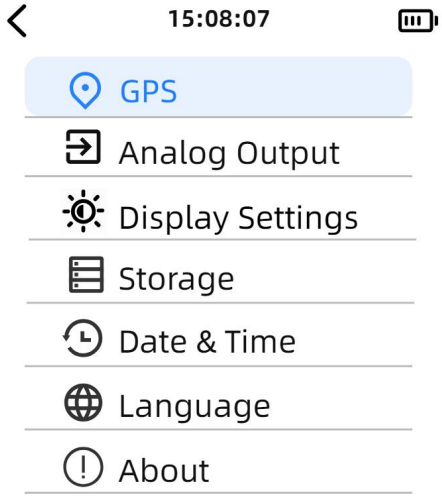
From the main interface screen, simply press the "Confirm" button to enter the "Settings" screen.

For the Bluetooth and WiFi version, the Settings provides access to WiFi connection, Bluetooth® connection, analog output, display settings, storage, date & time, language settings and device information.





For the GPS version, the Settings provides access to GPS, analog output, display settings, storage, date & time, language settings and device information.



3.4.1 WiFi

Users can use the button to turn on WiFi , and the bottom of the screen will display the detected WiFi networks. After selecting the desired WiFi network, press the "Confirm" button to enter the password. Once connected successfully, the screen will show the connected WiFi network.

3.4.2 Bluetooth®

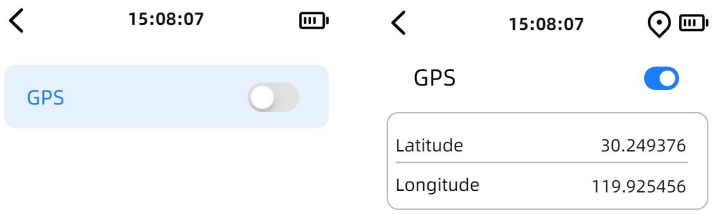
Users can use the button to turn on Bluetooth®, and the bottom of the screen will display the detected Bluetooth devices. After selecting the desired device, press the "Confirm" button. Once the connection is successful, the screen will show the connected Bluetooth device.

A typical application for Bluetooth is to connect to a Bluetooth printer for data printing.

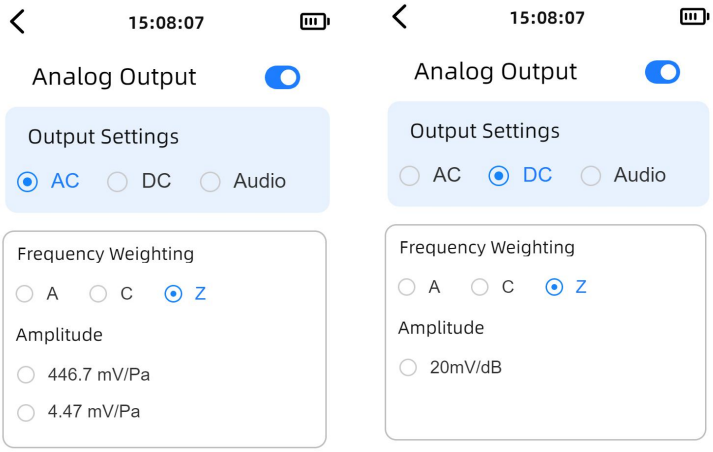
3.4.3 GPS

When the cursor selects "GPS" and the confirm button is pressed, the GPS interface will be accessed. With the cursor initially focused on the switch row, users can activate or deactivate positioning via the confirm button. Before activating positioning, users must verify installation of the external antenna. After ensuring the antenna is properly installed, activate the function in an open outdoor area;

latitude and longitude coordinates for the current location will typically display within seconds.



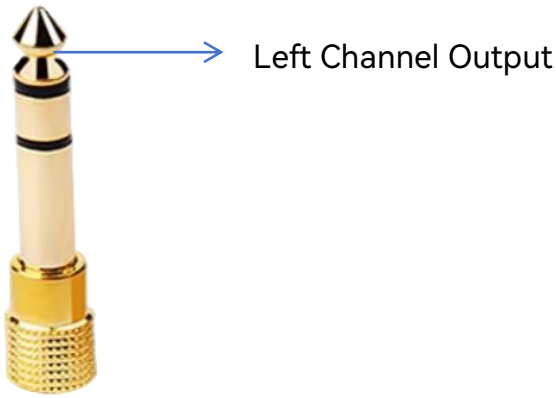
3.4.4 Analog Output



When "Analog Output" is selected by the cursor, pressing the confirm button enters the Analog Output interface.

By default, the cursor is focused on the switch row. The user can press the Confirm button to toggle the Analog Output function ON or OFF. The currently available Analog Output options are "AC", "DC", and "Audio".

The headphone output channel configuration is as follows:

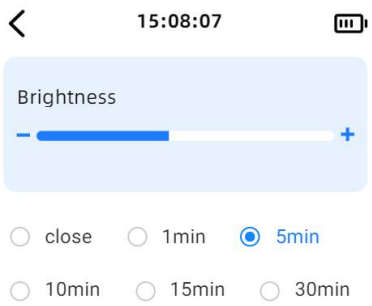


When "AC" is selected, users may choose A, C, or Z weighting and select between 446.7 mV/Pa or 4.47 mV/Pa amplitude ranges; upon enabling this function, a 1 kHz AC signal scaled according to the selected weighted sound pressure level will be output through the bottom connector.

When "DC" is selected, A, C, or Z weighting options are available, and enabling the function outputs a DC signal similarly scaled based on the chosen weighted sound pressure level.

When "Audio" is selected, gain adjustment becomes configurable according to input signal amplitude, and activation outputs the raw audio signal with specified gain through the bottom connector.

3.4.5 Display Settings

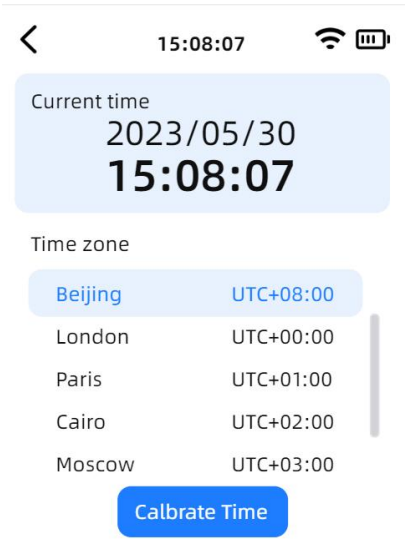


In the "Display Settings", users can adjust the screen brightness using the left and right buttons, and set the screen timeout below. The device defaults to 50% brightness and does not automatically turn off the screen.

3.4.6 Storage

Users can view the microSD card usage status on this screen.

3.4.7 Date & Time

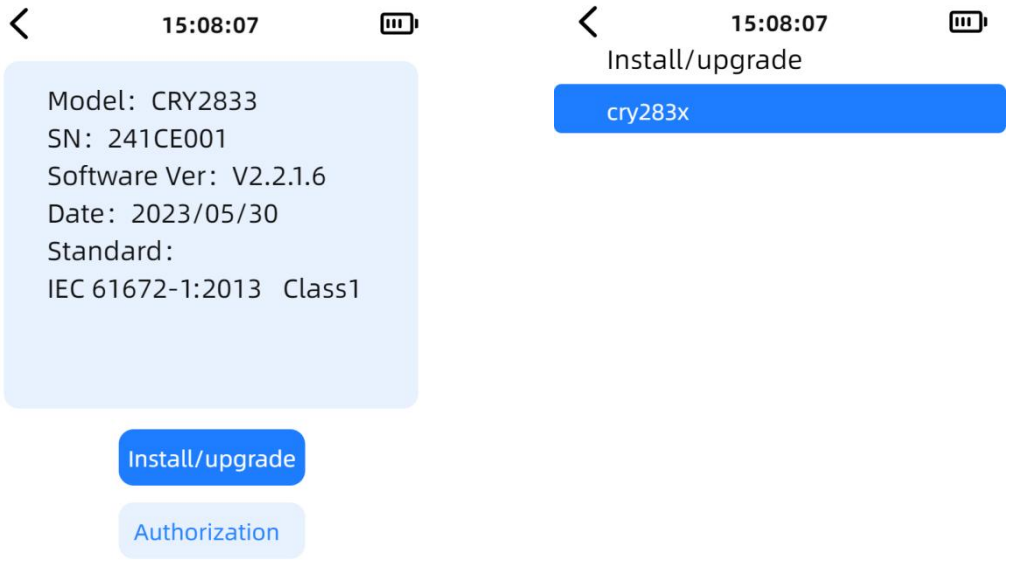


When the device is successfully connected to the internet or GPS lock acquired, users can enter the "Date & Time" to select the appropriate time zone and calibrate time.

3.4.8 Language

In the "Language" section, users can switch between Chinese and English.

3.4.9 About



In the "About" section, users can view device information, as well as perform authorization and upgrade operations.

3.4.9.1 Installation/Upgrade

How to download upgrade file

1- Insert the microSD card into the computer and create a folder named "update" in the root directory of the microSD card.

2- Extract the upgrade bin file and place it in the "cry283x" folder

within the "update" folder.

How to upgrade

1- Insert the microSD card while the device is powered off, then turn on the device.

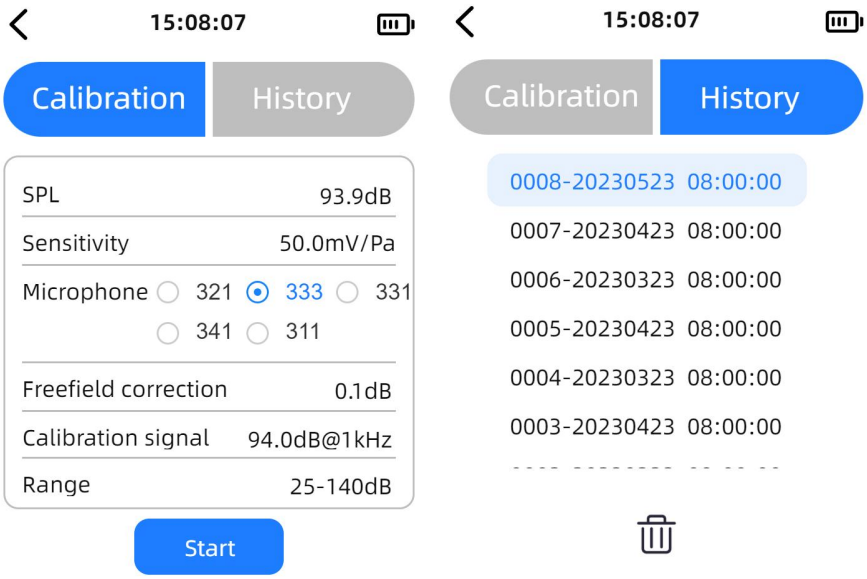
2- Go to "Settings" - "About" and click the "Installl/upgrade" button.

3- Select the corresponding installation package cry283x for installation. Please ensure the device has sufficient power during the installation process and do not perform any other operations.

3.4.9.2 Authorizaition

On this interface, users can view the current authorization status of the device. If you need to add authorization, please contact customer support.

3.5 Calibration



Users can click "Calibration" to enter the "Calibration" app. The "Calibration" interface displays the current sound pressure level and the microphone sensitivity. Users can set the microphone model, and the corresponding free-field correction value will change accordingly, with CRY2834 defaulting to the CRY331 sensor and CRY2833 defaulting to the CRY333 sensor.

Users can select from four different calibration signals. When the calibrator is connected and producing a stable sound, users can press "Start" to begin calibration. After calibration, the sensitivity will automatically update. If there are significant fluctuations in the sound signal during calibration, it may fail. We recommend to use a 114dB sound source in high background noise conditions for calibration.

Users can view the "Calibration History" in the "History" section and can select specific calibration records for deletion.

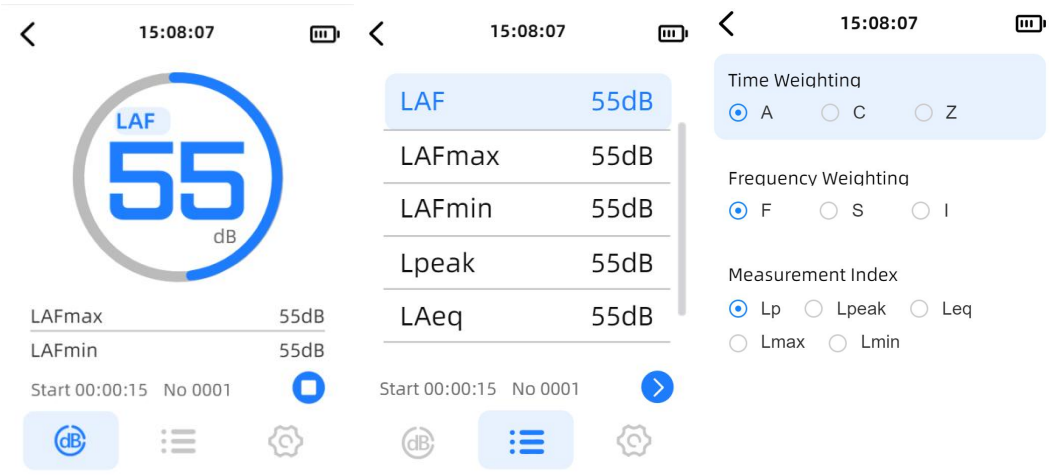
3.6 Measurement Parameters

Parameters	SLM (Basic)	SLM	Statistics	1/1 OCT	1/3 OCT
Lp, Lmax, Lpeak	■	■	■		
Leq, Lmin		■	■		
LN (N=5、10、50、90、95),SD			■		
1/1 OCT				■	
1/3 OCT					■

3.7 Use of the Testing App

The use of the SLM and statistics app on the sound level meter is quite similar.

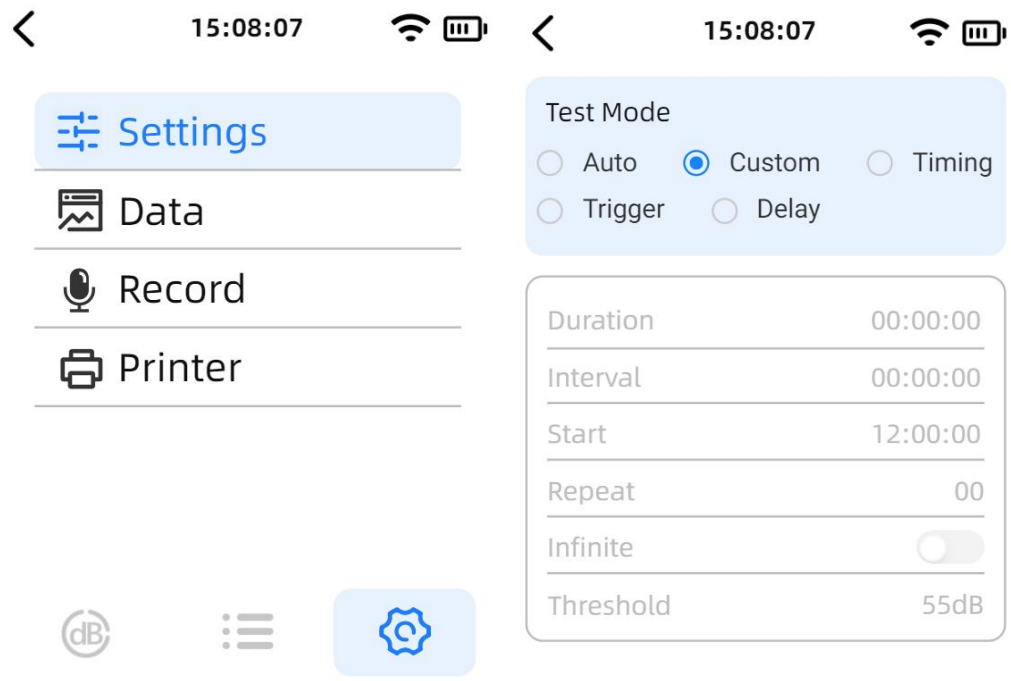
Below are the instructions for usage.



3.7.1 Parameter Interface

The sound level meter contains two measurement parameter interfaces, where users can set 3 or 5 test parameters on each interface. By clicking on a test parameter, users can enter the parameter selection and return to the parameter interface.

Users can click the "Test" button to start testing. During the test, a long press on the "Test" button will pause the test, while a short press will stop the test.



When users switch to the "Settings" interface, they can configure the test mode, view data playback, set recording options, and choose printing methods.

In the "Test Mode" settings, users can select from "Auto" , "Custom" , "Timing", "Trigger", and "Delay" test modes. The meanings of each test

mode are as follows:

① **Auto:** Test duration, test interval and repetition times can be set. After pressing the start measurement button, the test will be conducted according to the set test parameters and stored automatically.

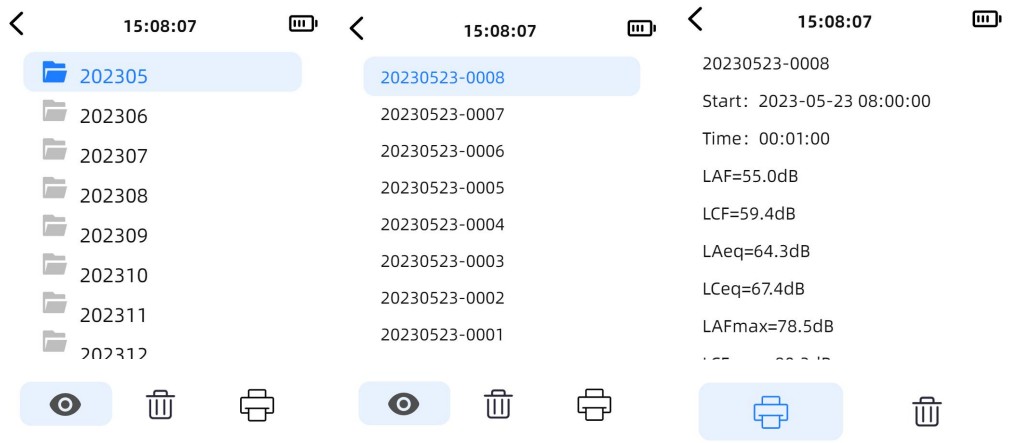
② **Custom**: Manually start a measurement and manually stop the measurement in the main interface operation button area.

③ **Timing**: You can set the test duration and start test time in the setting interface, and when it reaches the start test time, it will automatically start measuring and stop after reaching the test duration.

④ **Trigger**: The test duration and threshold value can be set in the setting interface. When the LAF reaches the set threshold value, the test will start automatically and the test time will be the test duration set by the user.

⑤ **Delay:** Users can set the duration for the delay. After pressing the test button, the device will not start testing immediately but will begin after the specified delay duration.

3.7.2 Data

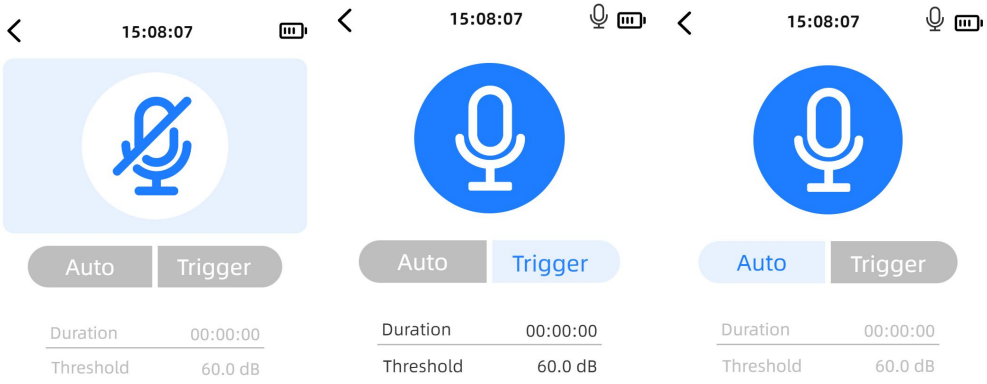


Users can click on "Data" to enter the data viewing list.

When the microSD card is inserted, the test data will be automatically saved to the microSD card. Users can find the corresponding test data files based on the test time, and click to review the data .

This feature only supports viewing the last second of data for all data displayed in the list. If you need to view all parameters during the test, you can insert the microSD card into the computer to view the CSV data file.

3.7.3 Record



Users can click on "Record" to enter the recording settings interface.

Press the "Confirm" button to control the start and stop of recording.

This device supports two recording modes: automatic(auto) and triggered. Below is an explanation of the two recording modes:

Auto: Start recording as soon as you start the test, no need to set the recording duration.

Trigger: you can set the recording duration as needed, when the LAF reaches the set threshold, it will automatically start recording, and the test time will be the recording duration set by the user.

3.7.4 Printer

Users can click on "Print" to enter the print settings interface.

This device supports two printing methods: "Bluetooth®" and "RS232", and supports two print formats: "Brief" and "Detailed".

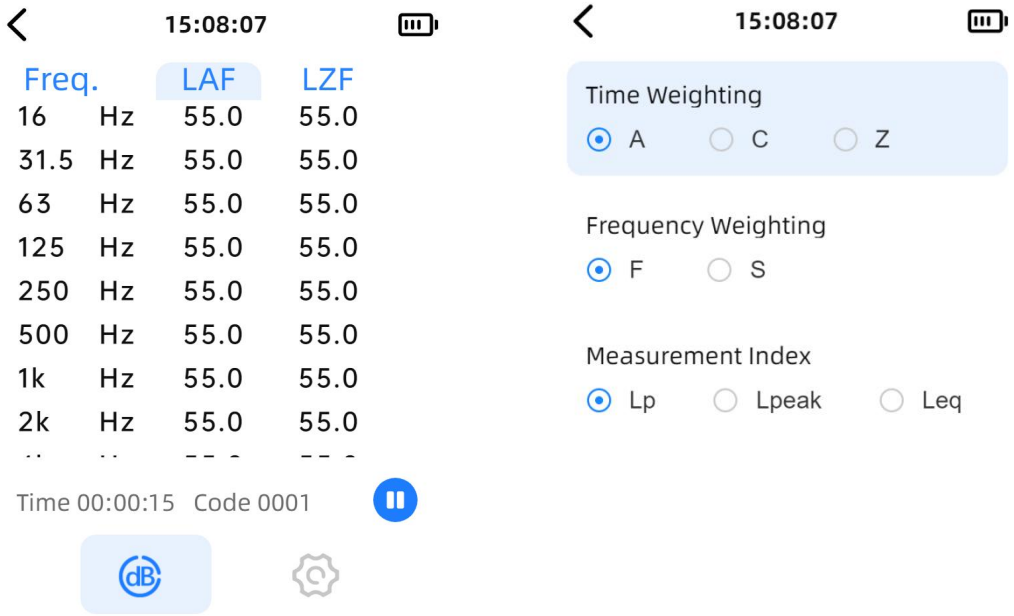
The usage instructions for the optional Bluetooth® printer can be found in Appendix E.

3.8 Use of the OCT App

1/1 OCT and 1/3 OCT measurement operation is similar to total value integration and can refer to 3.6. Below is an introduction to the interface display.

3.8.1 Parameter Interface

As shown in the figure, this is the display interface for the octave band. Once entered, users can select measurement parameters and display frequencies using the up and down keys. The left and right keys are used to switch between the measurement interface and the settings interface.



3.8.2 Settings

Users can enter the "Settings" interface by using the left and right arrow keys. For detailed operations, please refer to section 3.6.

4 Remote Control

CRY2833 & CRY2834 sound level meters support remote control via RS232 serial port. Users can control the device using the included RS232 to DB9 communication cable.

4.1 Serial Communication Parameters

Baud Rate	115200	Data Bits	8 bits
Parity Bit	None	Stop Bits	1 bit
Data Format	HEX		

4.2 Protocol Formatted Instructions

The following is for reference.

Slave Address	Function Code	Data	CRC

The slave address length is 1 byte, used in communication to distinguish between different devices on the bus. The CRY2830 sound level meter is defaulted to 01 as a placeholder.

4.3 CRY2833 & CRY2834 Register Definitions

The device parameters are stored in holding registers and can be read using function code 03.

The function code length is 1 byte, as illustrated in the following diagram:

Function Code	Function Introduction
03	Read holding register
04	Read input register
06	Write single register
10	Write multiple registers

The data length is multi-byte, and its composition format is as follows:

APP Function Reigister + Starting Address + Number of Registers to Read/Write + Data.

The various APP function codes are as follows:

APP Function Registers				
Address	0x00		0x02	0x03
Definition	Main Menu, Settings App, Calibration App		SLM	Statistics
Address	0x04	0x05	0x06	
Definition	SPL	1/1 OCT	1/3 OCT	

The holding registers are as follows:

Function Registers	Address	Data Content	Notes
0x00	0x16	SN	
0x00	0x20	Address	

The status register information is as follow:

Function Registers	Address	Data Content	Notes
0x02	0x03	Testing status	00 00 Stop testing
0x03			00 01 Start testing
0x05			00 02 Pause testing
0x06			00 03 Resume testing

4.4 CRY2830 Monitoring Series SPL Data Analysis

Input Register	High 8 bits	Low 8 bits
Definition	High 8 bits of SPL data	Low 8 bits of SPL data

SPL conversion formula:

SPL = (HiByte * 256 + LowByte) / 10

Example:

For the return value 01 8E, the corresponding sound pressure level is （1*256+8*16+14*1）/10=39.8 dB.

4.5 CRY2833 & CRY2834 Communication Example

Example 1: Control the SLM app to start the testing

Master Sends: 01 06 02 03 00 01 B9 B2

Send Data	HEX	Note
Slave Address	01	Address
Function Code	06	Write single register
High 8 Bits of Register Address	02	SLM APP
Low 8 Bits of Register Address	03	Testing status register
High 8 Bits of Number of Registers	00	
Low 8 Bits of Number of Registers	01	Start testing
Low 8 Bits of CRC Checksum	B9	
High 8 Bits of CRC Checksum	B2	

Example 2: Control the SLM app to stop the testing

Master Sends: 01 06 02 03 00 00 78 72

Send Data	HEX	Note
Slave Address	01	Address
Function Code	06	Write single register
High 8 Bits of Register Address	02	SLM APP
Low 8 Bits of Register Address	03	Testing status register
High 8 Bits of Number of Registers	00	
Low 8 Bits of Number of Registers	00	Stop testing

Low 8 Bits of CRC Checksum	78
High 8 Bits of CRC Checksum	72

Slave Response: 01 10 02 E1 02 18 02 02 02 11 02 22 02 A1 02 B7 02 89 72 B3

Send Data	HEX	Note
Slave Address	01	
Function Code	10	
High 8 Bits of Register Address	02	SPL1
Low 8 Bits of Register Address	E1	
High 8 Bits of Register Address	02	SPL2
Low 8 Bits of Register Address	18	
High 8 Bits of Register Address	02	SPL3
Low 8 Bits of Register Address	02	
High 8 Bits of Register Address	02	SPL4
Low 8 Bits of Register Address	11	
High 8 Bits of Register Address	02	SPL5
Low 8 Bits of Register Address	22	
High 8 Bits of Register Address	02	SPL6
Low 8 Bits of Register Address	A1	
High 8 Bits of Register Address	02	SPL7
Low 8 Bits of Register Address	B7	

High 8 Bits of Register Address	02	SPL8
Low 8 Bits of Register Address	89	
Low 8 Bits of CRC Checksum	72	
High 8 Bits of CRC Checksum	B3	

Note: In manual mode, when the stop test command is sent, the device will return the eight parameters displayed on the measurement interface. In automatic mode, after reaching the test end status, the device will also automatically return to the measurement interface to display the eight parameters.

Example 3: Underrange status return

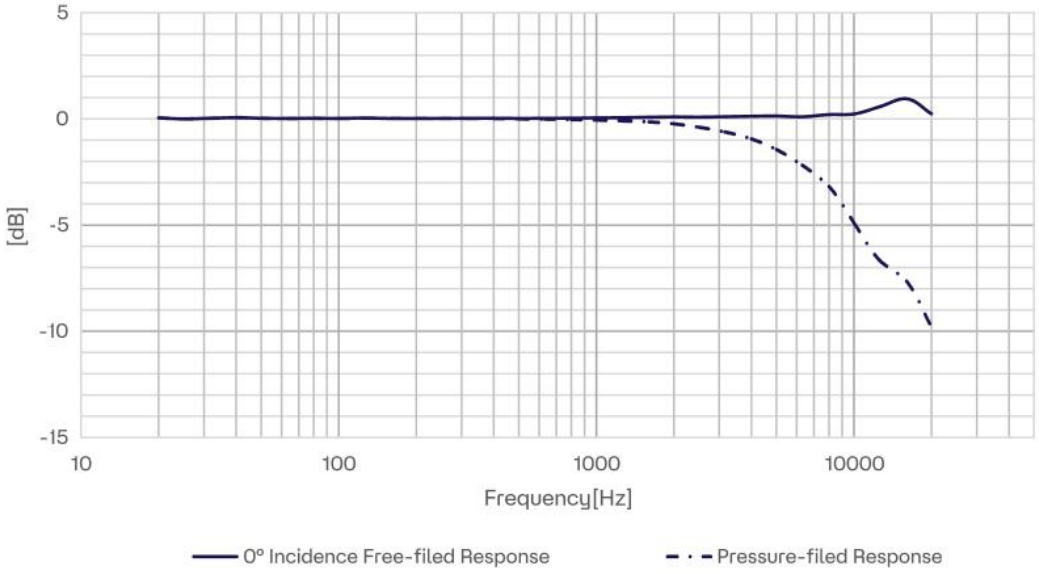
Slave Response: 01 04 02 03 02 00 01 13 C0

Send Data	HEX	Note
Slave Address	01	Address
Function Code	04	Read single register
High 8 Bits of Register Address	02	SLM APP
Low 8 Bits of Register Address	03	Testing status register
Return Byte	02	
High 8 Bits of Number of Registers	00	
Low 8 Bits of Number of Registers	01	01 Underrange 02 Overload
Low 8 Bits of CRC Checksum	13	
High 8 Bits of CRC Checksum	C0	

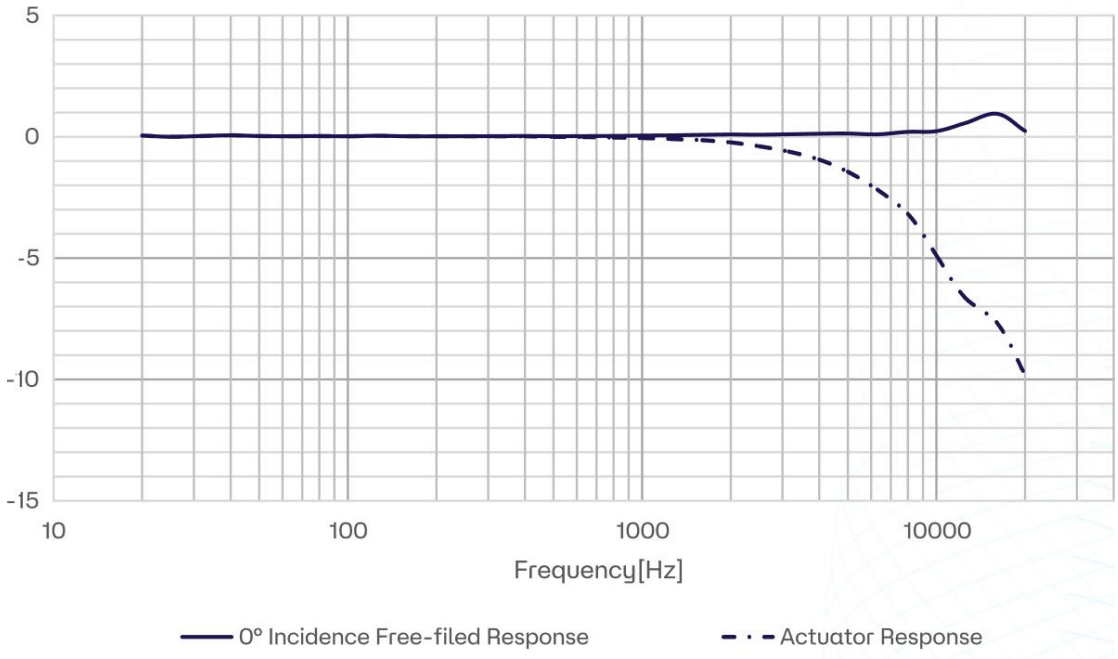
Appendix A: Table of Measured Values

Measured Values	
Lp	Sound pressure level
Leq	Equivalent continuous sound level
Lmax	Maximum sound level
Lmin	Minimum sound level
Lpeak	Peak sound level
LN	Percentile sound level

Appendix B: CRY333 Typical Frequency Response (0° Incidence Angle)



Appendix C: CRY331 Typical Frequency Response (0° Incidence Angle)



Appendix D: Impact of Extension Cable

Note: The CRY2833 & CRY2834 sound level meters are equipped with a 5-meter extension cable.

SPL	140dB	130dB	120dB	110dB
125Hz	0	0	0	0
250Hz	0	0	0	0
315Hz	0	0	0	0
400Hz	0	0	0	0
500Hz	0	0	0	0
630Hz	0	0	0	0
800Hz	0	0	0	0
1kHz	0	0	0	0
1.25kHz	0	0	0	0
1.6kHz	0	0	0	0
2.0kHz	0	0	0	0
2.5kHz	0	0	0	0
3.15kHz	0	0	0	0
4kHz	0	0	0	0
5kHz	0	0	0	0
6.3kHz	0	0	0	0
8kHz	0.1	0	0	0
10kHz	0.5	0	0	0
12.5kHz	1.0	0	0	0
16kHz	2.0	0	0	0

Appendix E: The Usage Instructions for the Bluetooth® Printer

Power On: Press and hold the power button for 3 seconds to turn on the printer. The working status indicator will light up; if the power button is not pressed for 3 seconds, the printer will not turn on.

Power Off: While in the powered-on state, press and hold the power button for 3 seconds to turn off the printer; the working status indicator will go out.

Paper Feed: Press and hold the paper feed button to automatically feed the paper.

Printer Usage Precautions:

a. Ensure all cables are properly connected before powering on the printer.

b. Always use the original charger and connection cables to avoid malfunctions.

c. Regularly charge batteries that are not frequently used to extend their lifespan.

d. Use compliant paper rolls to prolong the life of the printer's heating element.

e. Do not print without paper, as this can severely damage the thermal print head.