



Portable Gas Detector (Diffusion Type)
BX80 Operation Manual

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Important Notice to Users

Please read this manual carefully before using the instrument

1. Overview

This product is a flexibly configurable single-gas or multi-gas detection and alarm instrument that can be equipped with up to four types of gas sensors (catalytic sensors, electrochemical sensors, infrared sensors, and photoionization sensors).

The product is equipped with a COG LCD screen and audio-visual-vibration alarm prompts, ensuring the detection of dangerous gases and timely reminders for operators to take precautions even in extremely adverse working environments.

2. Technical Performance and Parameters

- Compact, lightweight, and durable
- Audio, visual, and vibration alarm prompts
- Equipped with a COG LCD screen with free switching between Chinese and English interfaces
- Self-test of display, battery, sensor, and audio-visual-vibration alarm functions upon startup
- Periodic flashing light prompts
- Outstanding audio alarm
- Supports simultaneous detection of up to 4 gases
- Low maintenance costs
- Can store 130,000 gas detection data records (for models with storage function only)
- Stored data can be read and freely printed via USB connection to a computer (for models with storage function only)

Main Technical Indicators

Detected Gas	Measuring Range	Accuracy	Minimum Reading	Response Time
Oxygen (O ₂)	(0~30)%VOL	<±5%(F.S)	0.1%VOL	≤ 20s
Flammable Gas (Ex)	(0~100)%LEL	<±5%(F.S)	1%LEL	≤ 15s
Carbon Monoxide (Co)	(0~1000)*10 ⁻⁶	<±5%(F.S)	1*10 ⁻⁶	≤ 25s
Hydrogen Sulfide (H ₂ S)	(0~100)*10 ⁻⁶	<±5%(F.S)	1*10 ⁻⁶	≤ 30s
Sulfur Dioxide(SO ₂)	(0~100)*10 ⁻⁶	<±5%(F.S)	0.1*10 ⁻⁶	≤ 30s
Nitric Oxide (NO)	(0~250)*10 ⁻⁶	<±5%(F.S)	1*10 ⁻⁶	≤ 60s
Nitrogen Dioxide (NO ₂)	(0~20)*10 ⁻⁶	<±5%(F.S)	0.1*10 ⁻⁶	≤ 25s
Chlorine (CL ₂)	(0~20)*10 ⁻⁶	<±5%(F.S)	0.1*10 ⁻⁶	≤ 30s
Ammonia (NH ₃)	(0~100)*10 ⁻⁶	<±5%(F.S)	1*10 ⁻⁶	≤ 50s
Hydrogen (H ₂)	(0~1000)*10 ⁻⁶	<±5%(F.S)	1*10 ⁻⁶	≤ 60s
Hydrogen Cyanide (HCN)	(0~50)*10 ⁻⁶	<±5%(F.S)	0.1*10 ⁻⁶	≤ 200s
Hydrogen Chloride (HCL)	(0~30)*10 ⁻⁶	<±5%(F.S)	0.1*10 ⁻⁶	≤ 60s
Phosphine (PH ₃)	(0~20)*10 ⁻⁶	<±5%(F.S)	0.1*10 ⁻⁶	≤ 25s
Ozone (O ₃)	(0~20)*10 ⁻⁶	<±5%(F.S)	0.1*10 ⁻⁶	≤ 50s

Detection Method:

Diffusion type

Battery:

3.7V lithium-ion rechargeable battery

Battery Working Time:

Continuous operation for 15 hours (combustible gases)

Continuous operation for about 200 hours (except combustible gases)

Sensor Working Principle:

Electrochemical, catalytic combustion, infrared, ionization type

Sensor Lifespan:

Catalytic sensors: 3 years

Electrochemical sensors: 2 years

Infrared type: over 5 years

Ionization type: 6 months

Display:

Large-screen LCD display, with free switching between Chinese and English interfaces

Alarm:

Acoustic, light, and vibration alarm

Direct Readings:

Instantaneous value, peak value, battery voltage, TWA, STEL

Explosion-proof Mark:

Ex ia IIC T4 Ga

Protection Class:

IP45/IP65

Operating Temperature:

(-10~70)° C

Operating Humidity:

(5~90)%RH

Dimensions:

146mm (L) x 71mm (W) x 33mm (T)

Weight:

270g

Low Battery

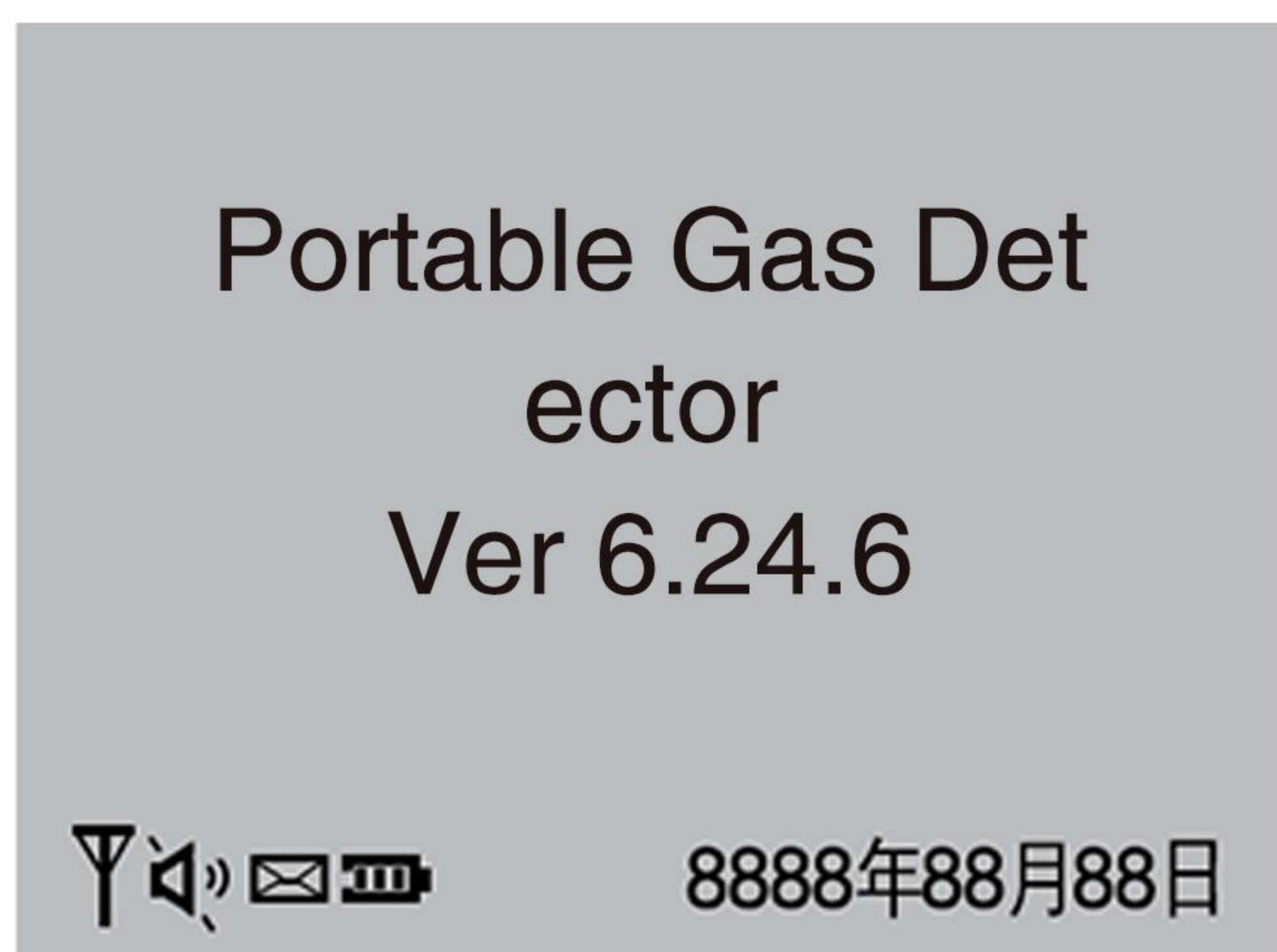
When the instrument's battery power is lower than the preset value, an audio–visual under–voltage alarm will be triggered to remind the operator that the battery is low and needs to be charged. During the under–voltage alarm, in addition to the audio–visual alarm, the battery under–voltage symbol  will flash on the screen. When the battery is fully discharged, a countdown will appear on the screen, and the instrument will automatically shut down.

After the under–voltage alarm is triggered, the operator should turn off the instrument and charge it. The charging time is approximately 4–6 hours.

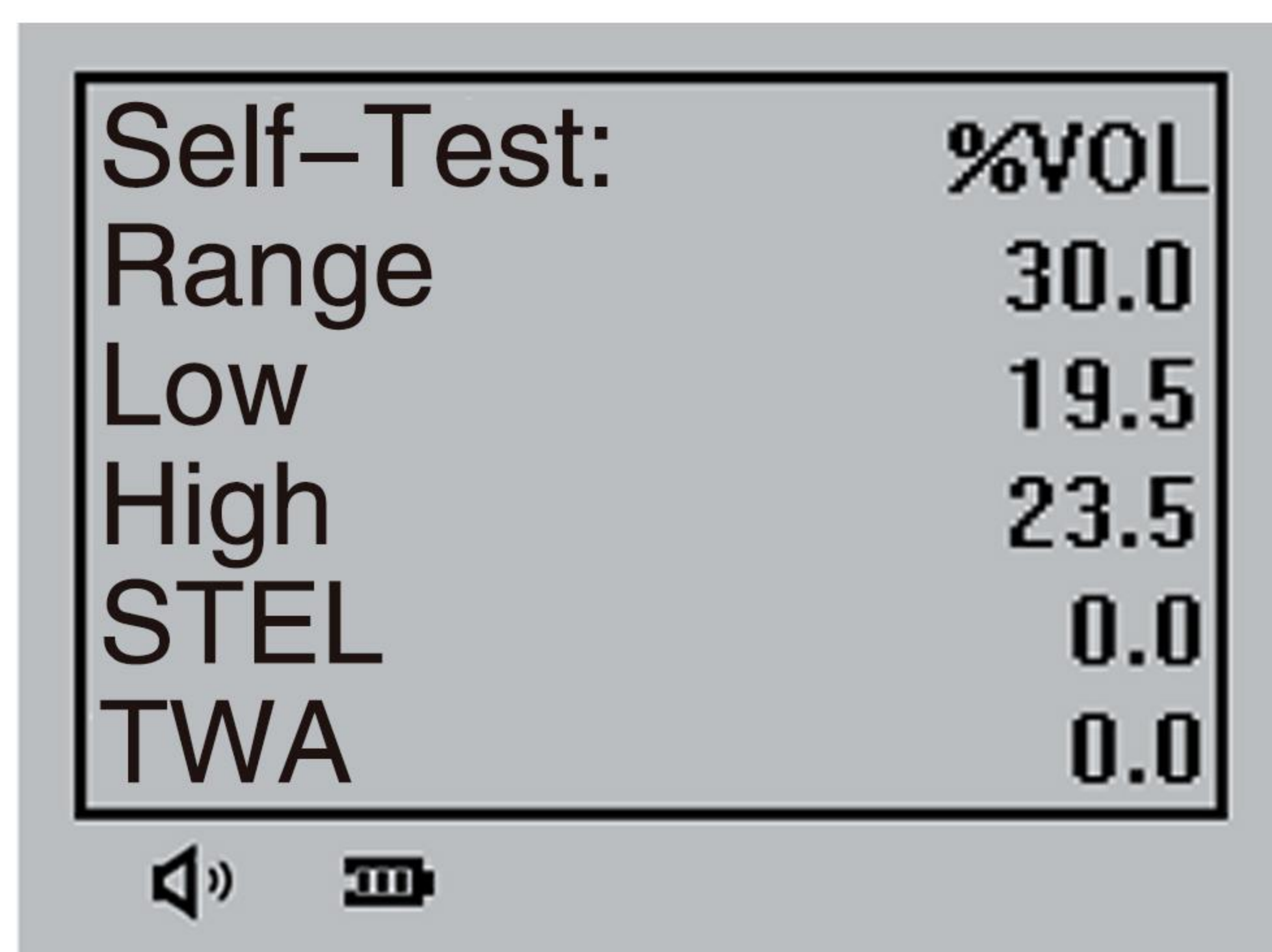
3.2 Instrument Self–Test

Press the " ; two short beeps will sound, and the display will show the following information:

1. Display all numbers and character prompts: Check audio, light alarm, battery, circuit, and sensor.



Product Name and Version



Channel 1 Parameters

Self-Test: EX	%LEL
Range	100
Low	25
High	50
STEL	0
TWA	0

Channel 2 Parameters

Self-Test: CO	PPM
Range	1000
Low	35
High	200
STEL	200
TWA	200

Channel 3 Parameters

Self-Test: H2S	PPM
Range	100
Low	10
High	20
STEL	20
TWA	20

Channel 4 Parameters

O2	20.9	Ex	0
	%VOL		%LEL
CO	0	H2S	0
	PPM		PPM

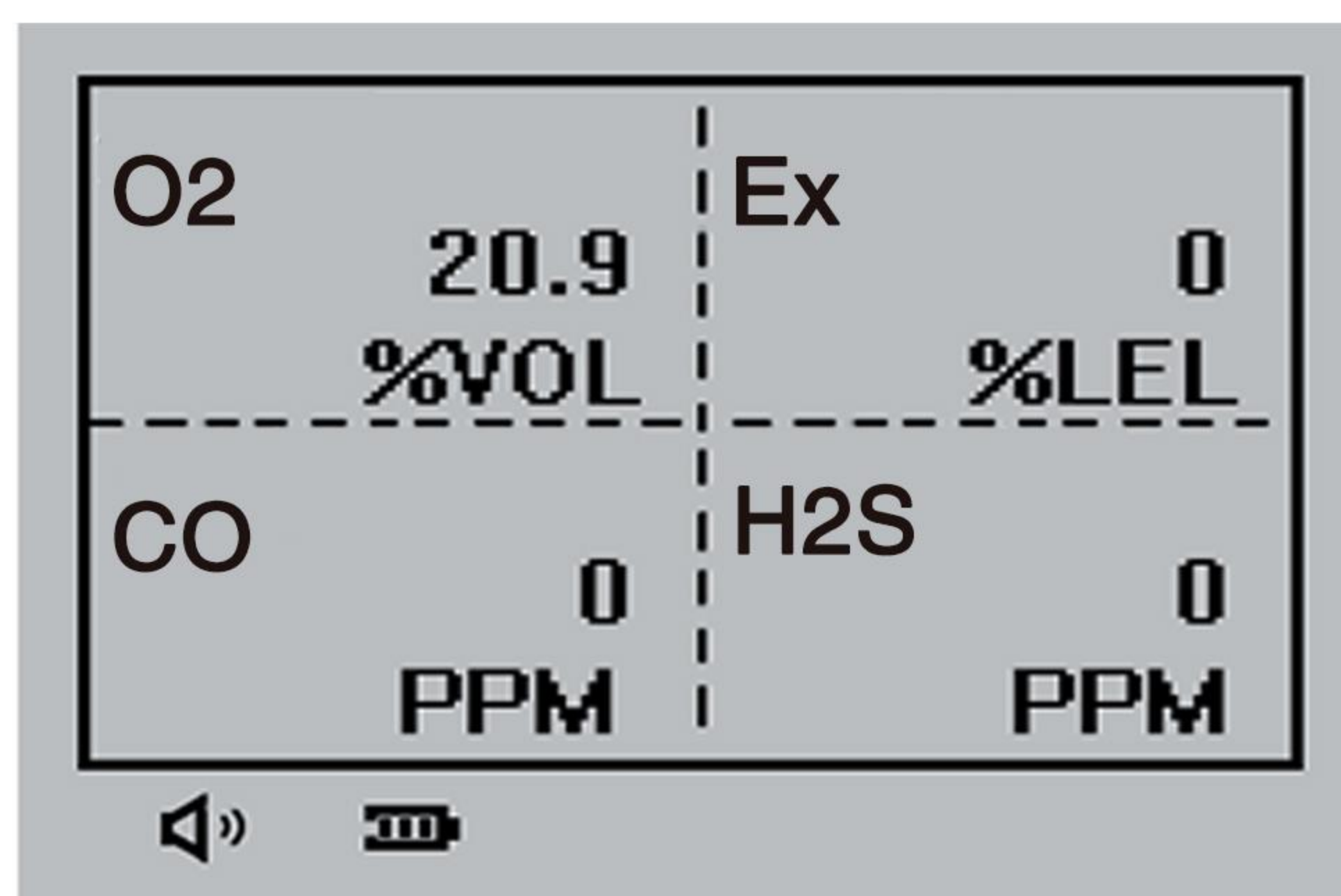
Detection Status

Note: If the self-test fails, re-perform the self-test. If it fails again, please contact us or the local agent/service provider.

3.3 Measurement Mode

The instrument can be used in "diffusion" or "aspiration" measurement mode. During normal operation, the instrument can be fixed on a belt or held by hand. Once powered on, the instrument will perform continuous measurement. Ambient air can enter the sensor through diffusion; usually, air flow can directly deliver the target gas to the sensor, which will respond to the gas concentration and display the measurement result. The principle of diffusion detection is to directly detect the gas concentration around the instrument in the above manner. The disadvantage of diffusion is slow response time. If remote detection of gas at the sampling location is required, the aspiration measurement method should be used. At this time, the instrument needs to use a calibration hood and a sampling pump (an external sampling pump from our company is optional).

The gas name, concentration value, and unit are displayed independently on the same screen. If fewer than 4 sensors are installed, the positions of the uninstalled sensors will be displayed as blank.



Detection Status

3.3 Gas Alarm

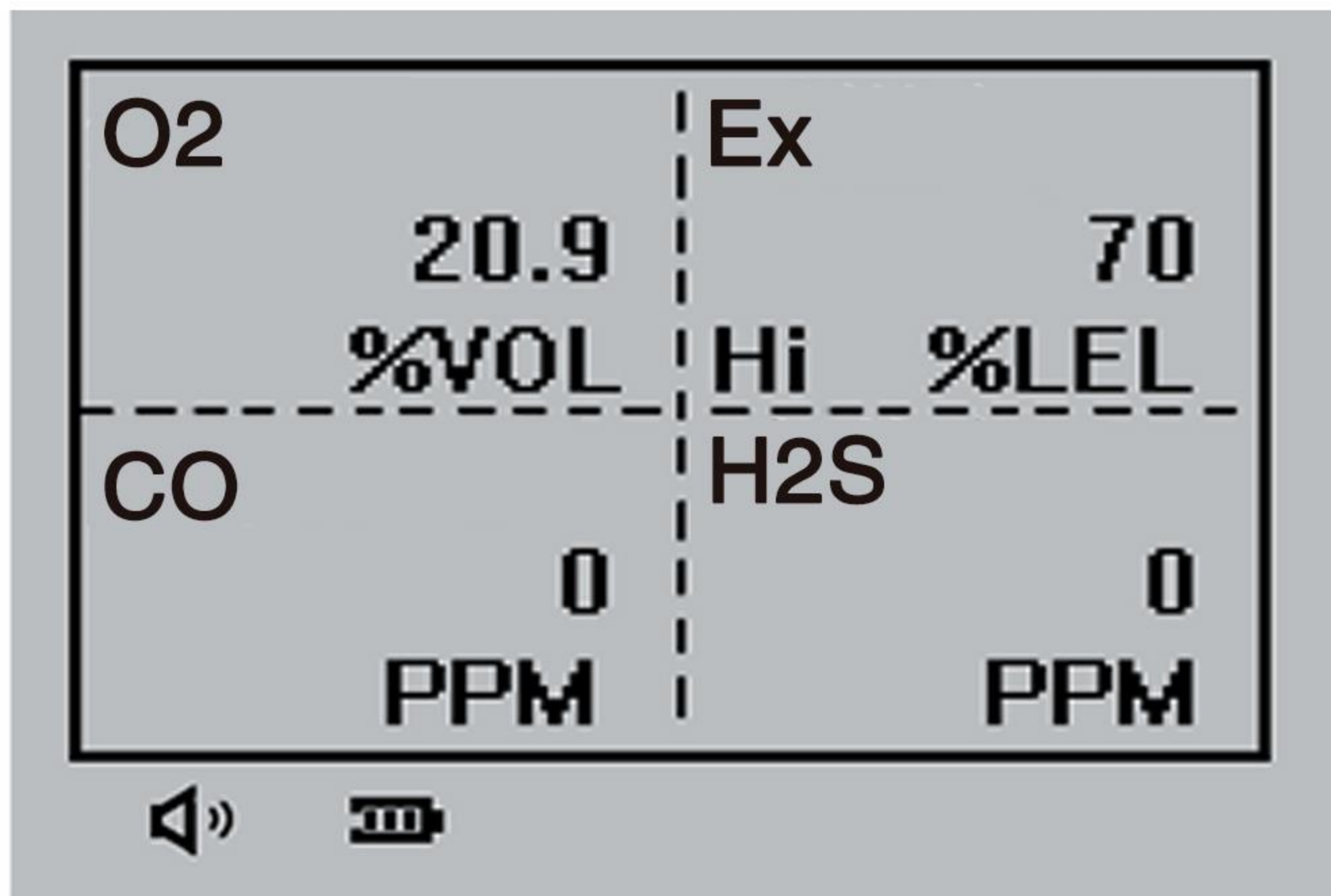
The instrument has two instantaneous gas alarm levels: the secondary alarm point Hi (high concentration alarm) requires more urgent handling for hazards than the primary alarm point Lo (low concentration alarm). For toxic gases, there are also the 15-minute allowable average exposure concentration STEL alarm point and the 8-hour allowable average exposure concentration TWA alarm point.

Users can set the primary alarm point, secondary alarm point, STEL alarm point, and TWA alarm point in the setting working mode.

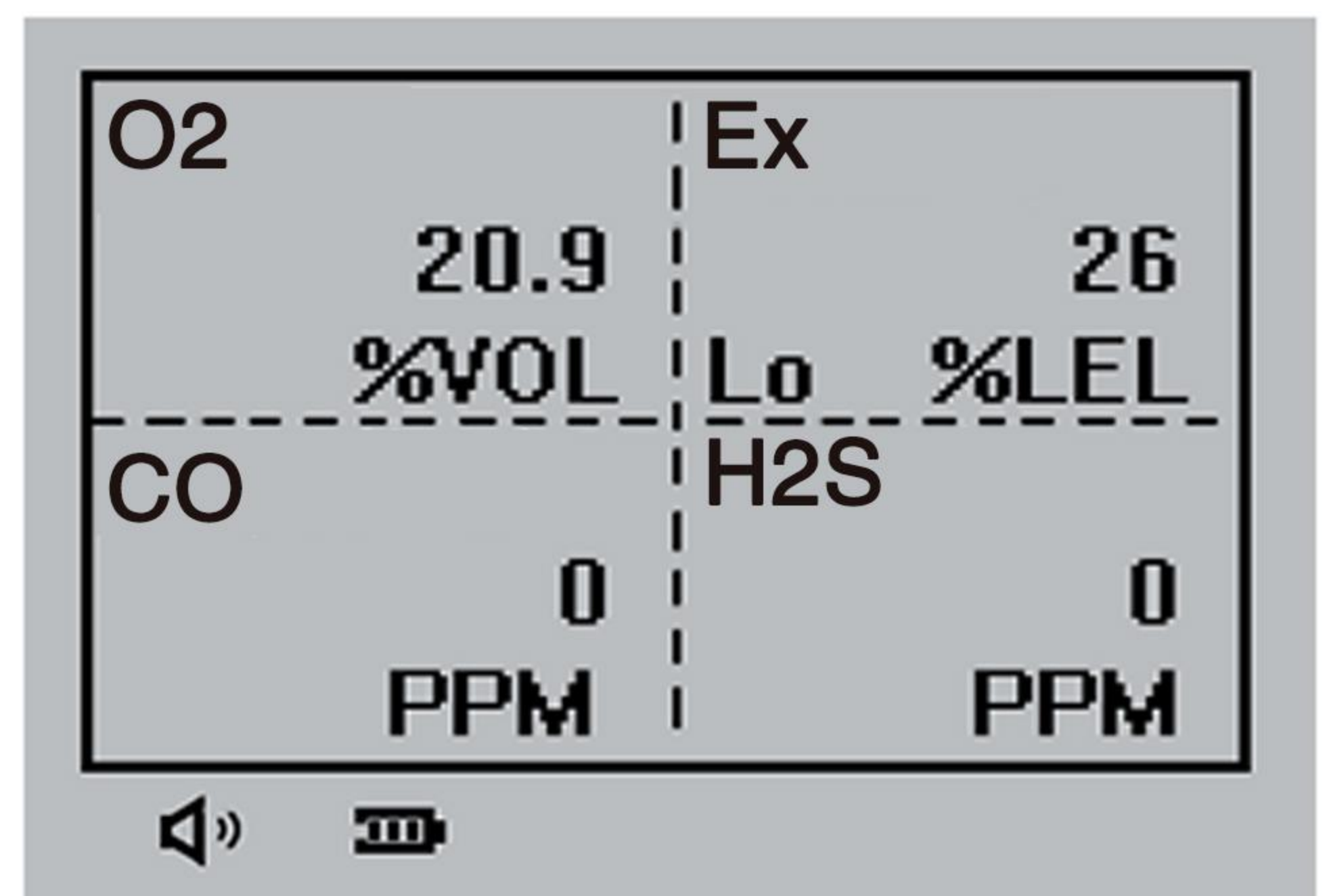
Explanation: STEL is the abbreviation of Short Time Exposure Limit, and TWA is the abbreviation of Time-Weighted Average.

Note: The set value of the primary alarm point cannot exceed that of the secondary alarm point. If the two set values are the same, the instrument will execute the secondary alarm function.

If an alarm occurs, the following two situations will appear (taking flammable gas alarm as an example)



Level 2 Alarm



Level 1 Alarm

If the concentration of the detected gas exceeds the measurement range, the full-scale value will flash simultaneously with the alarm.

3.3.2 Audible and Visual Operation Prompt

The instrument can be set to provide a visual operation prompt at regular intervals to indicate that it is operating normally. Users can choose to enable or disable this function (see the setup menu). The interval for the visual operation prompt can be configured, with a default of 10 seconds.

3.4 Setup Mode

Note: In setup mode, the instrument cannot be used for measurements.

Operators can configure the following functions in setup mode.

- Operation Prompt
- Alarm Function
- Alarm Settings
- Level 1 Alarm Setpoint
- Level 2 Alarm Setpoint
- STEL Alarm Setpoint
- TWA Alarm Setpoint
- Factory Reset
- View Factory Time
- Zero Calibration
- Gas Calibration
- Storage Settings
(for models with storage only)
- Language Settings

3.4.1 Enter Setup Mode

In normal measurement mode, press and hold the "M" button for approximately 3 seconds. The instrument will emit an audible prompt, indicating that it has entered setup mode.

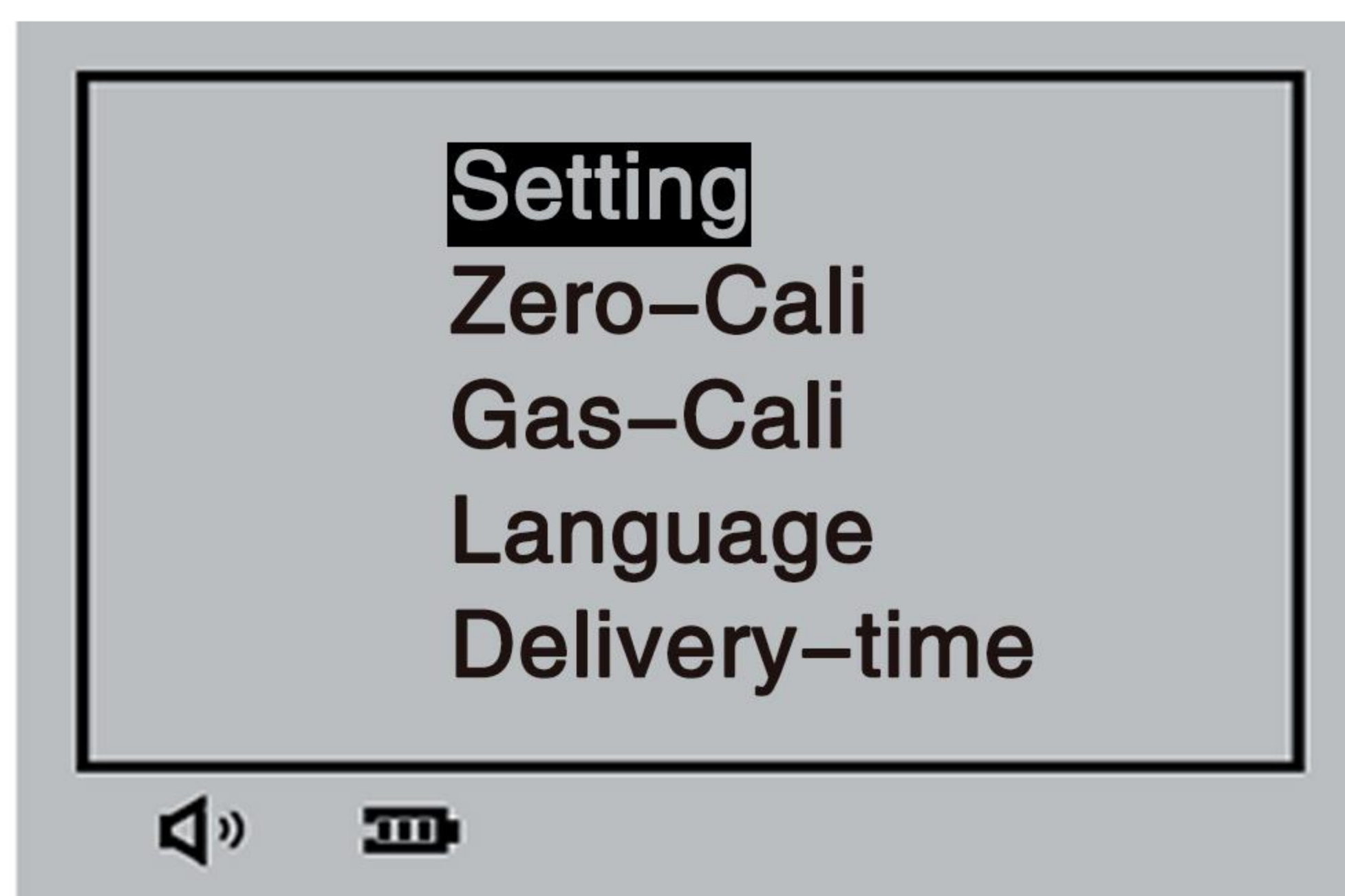


Figure 1

3.4.2 Changing Instrument Parameter Settings

After entering setup mode, move the black cursor to "Parameter Settings" and press the "1" button to confirm and enter the secondary menu, as shown in Figure 2.

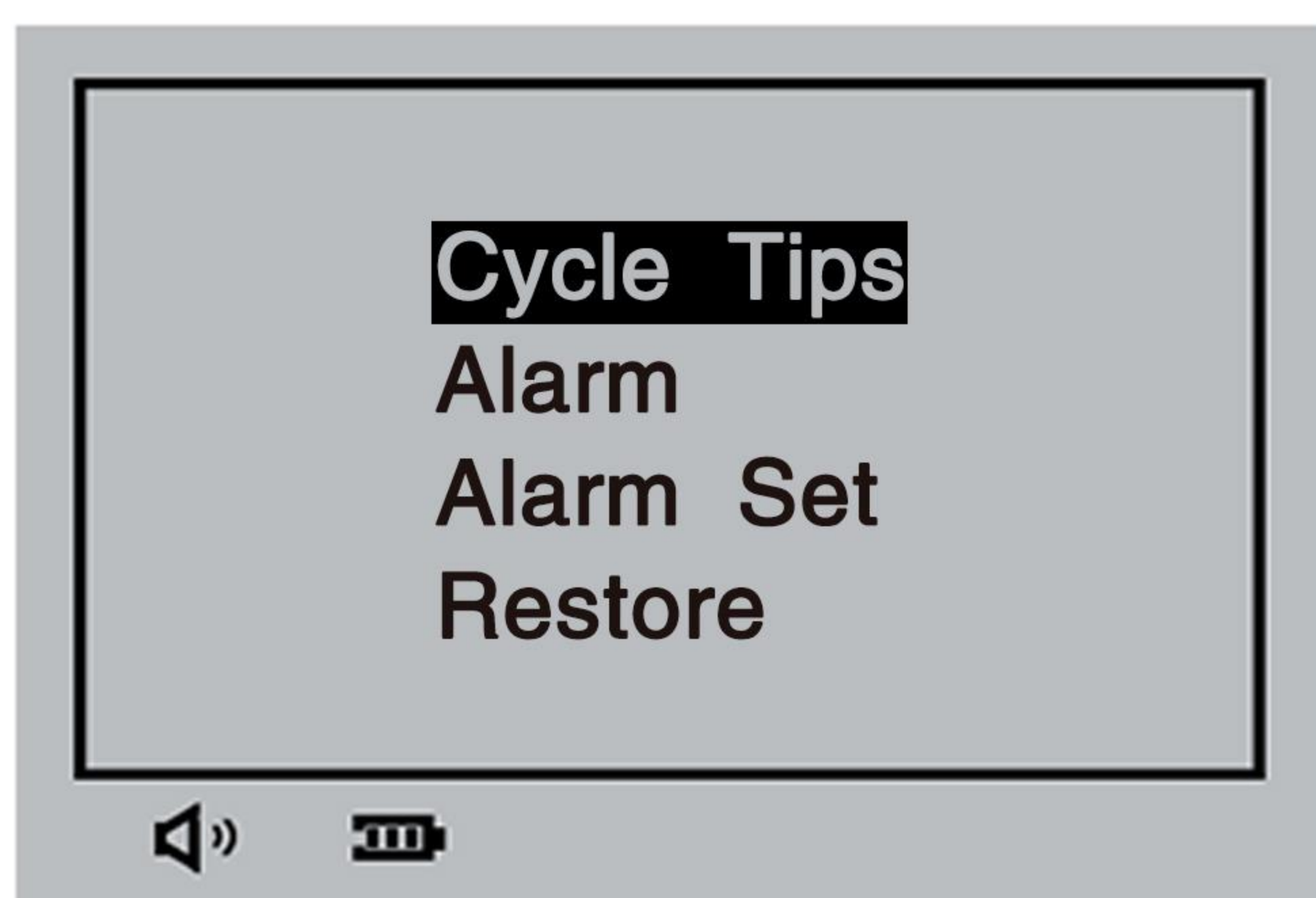


Figure 2

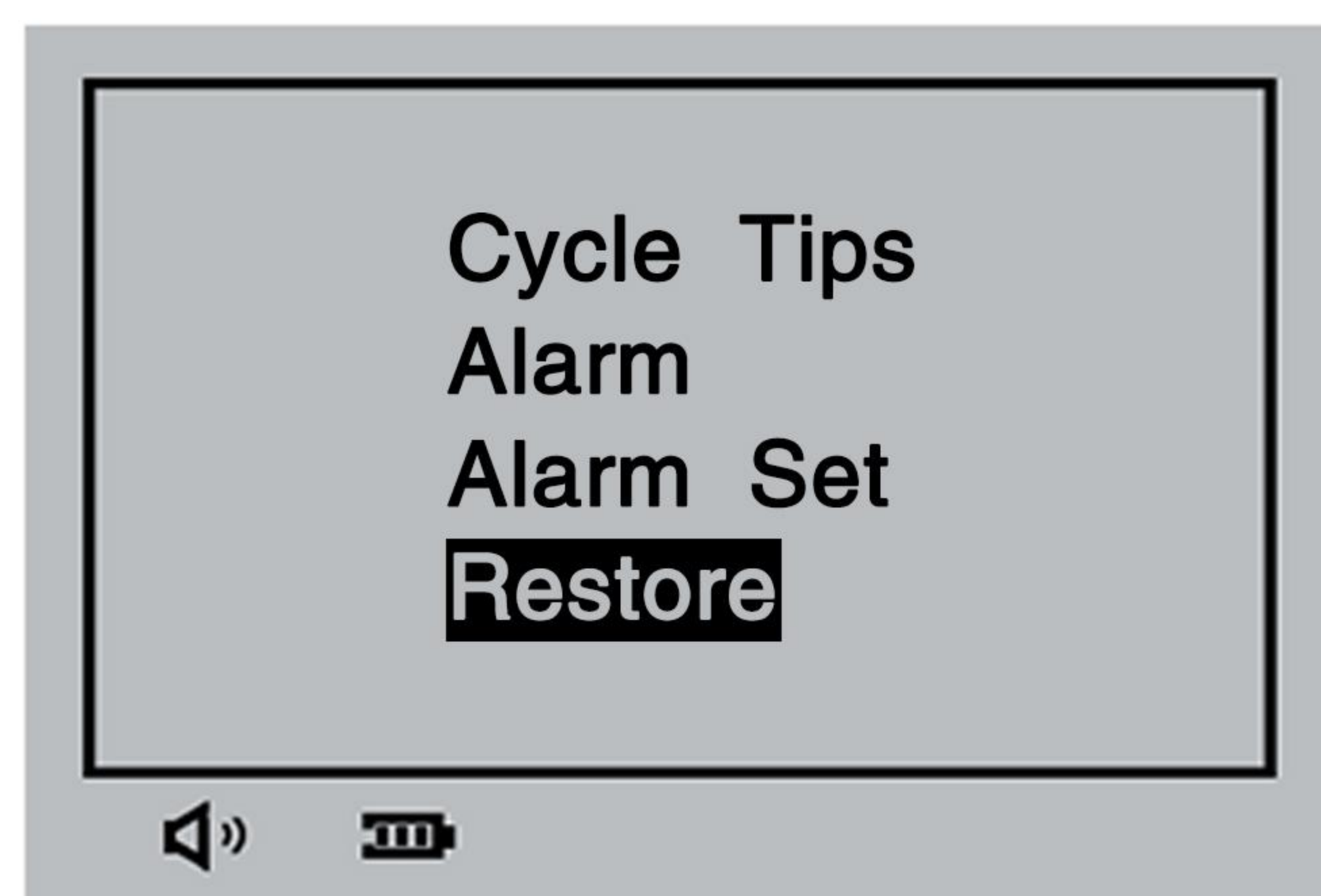


Figure 3

The secondary menu for parameter settings includes Operation Prompt, Alarm Function, Alarm Settings, and Restore Parameters. You can navigate between pages by pressing the "▲" (up) or "▼" (down) buttons, as shown in Figures 2 and 3.

3.4.2.1 Operation Prompt Settings

In the current state shown in Figure 2, press the "①" button to confirm the selection and proceed to the screen shown in Figure 4.

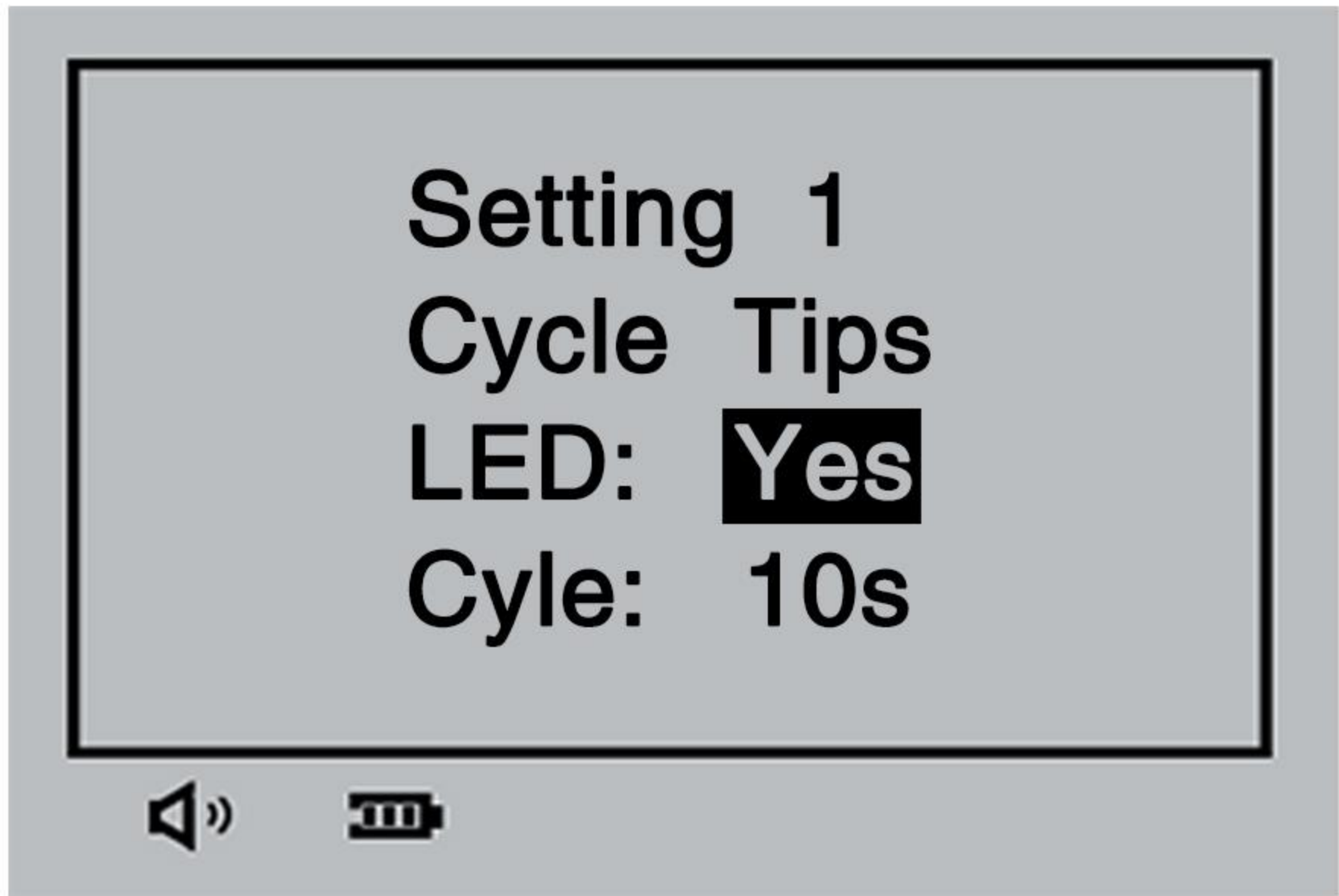


Figure 4

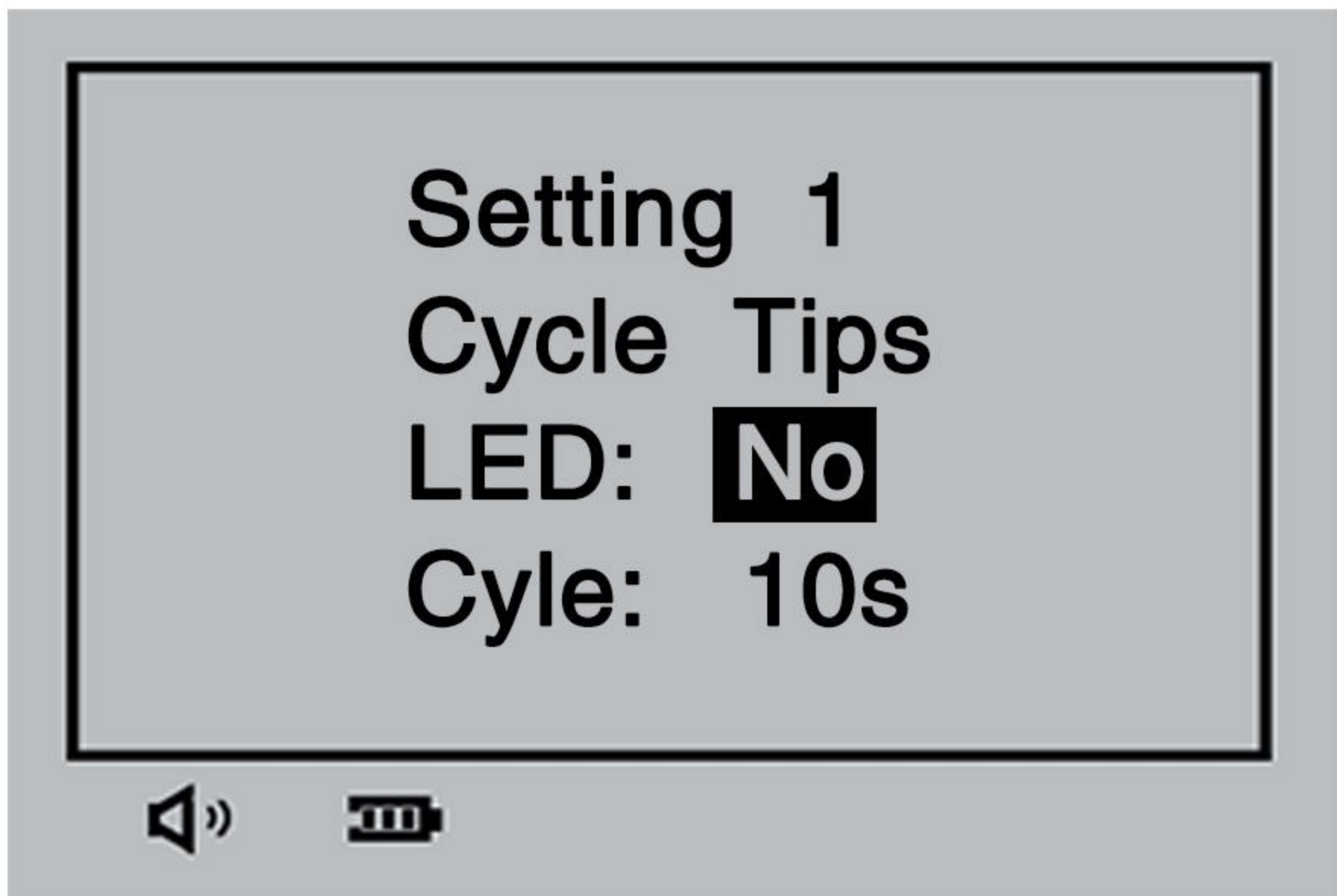


Figure 5

You can select "Yes" (see Figure 4) or "No" (see Figure 5) by pressing the "▲" (up) or "▼" (down) buttons. Press the "①" button to confirm, then enter the interval time setting. Modify the value using the "▲" or "▼" buttons, and press "①" to save and return, or press "M" to exit without saving and return to Figure 2.

3.4.2.2 Alarm Function Settings

In the current state shown in Figure 2, press the "▼" (down) button to select "Alarm Function", then press the "①" button to confirm the selection and proceed to the screen shown in Figure 7.

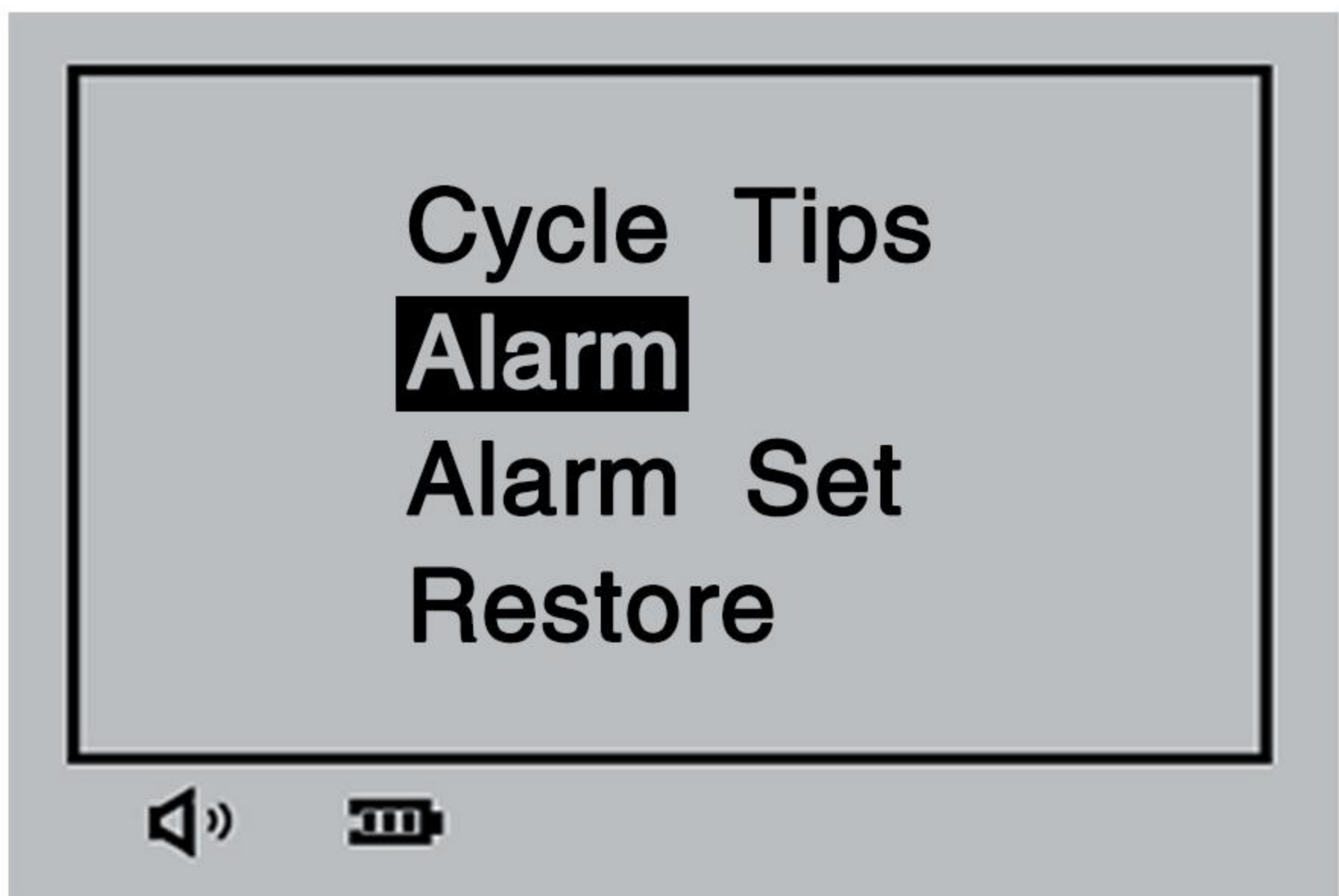


Figure 6

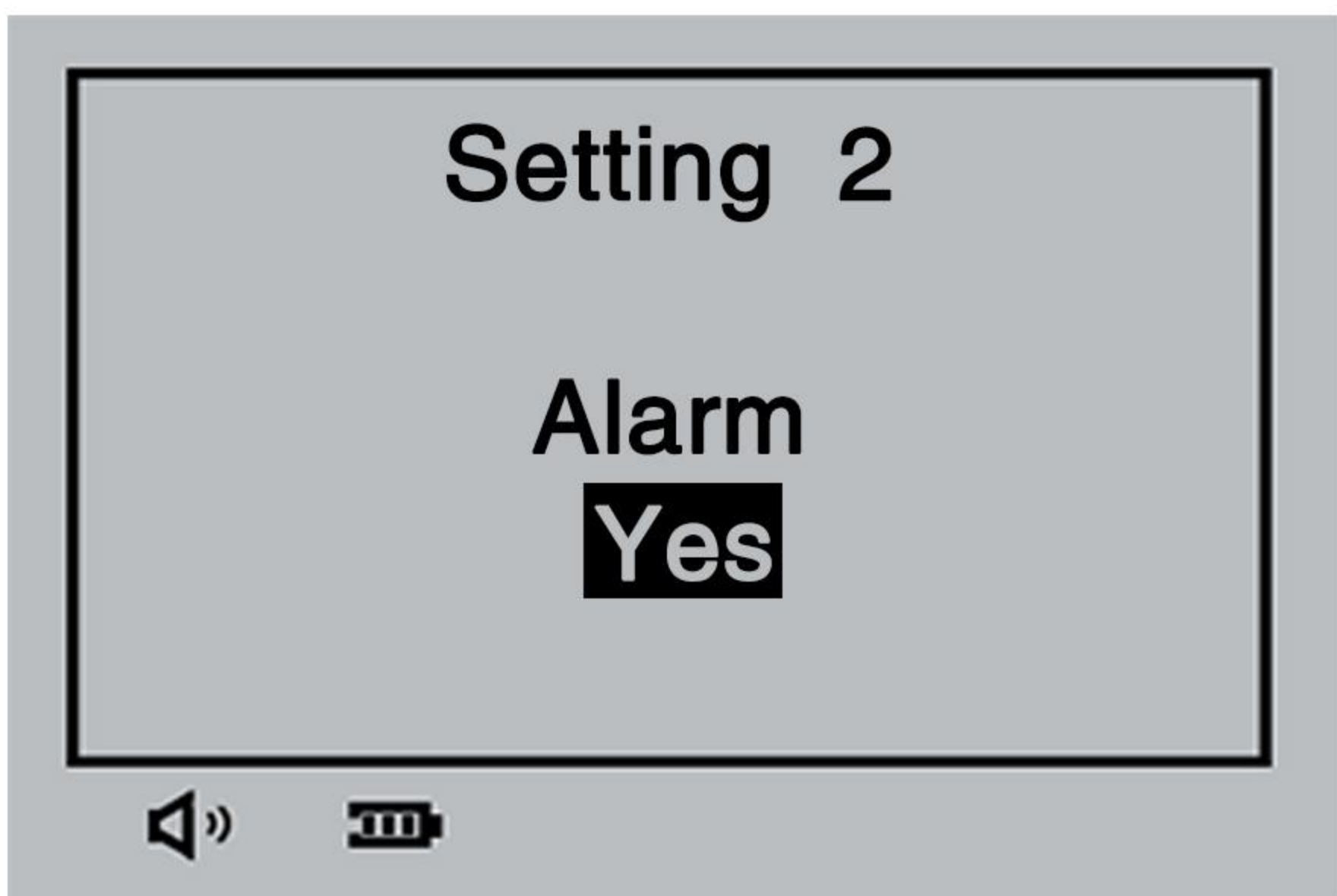


Figure 7

You can select "Yes" or "No" by pressing the "▲" (up) or "▼" (down) buttons. Press the "①" button to confirm and save, then return to Figure 6, or press the "M" button to exit without saving and return to Figure 6.

3.4.2.3 Alarm Value Settings

In the current state shown in Figure 2, press the "▼" (down) button to select "Alarm Settings", then press the "①" button to confirm the selection and proceed to the screen shown in Figure 8.

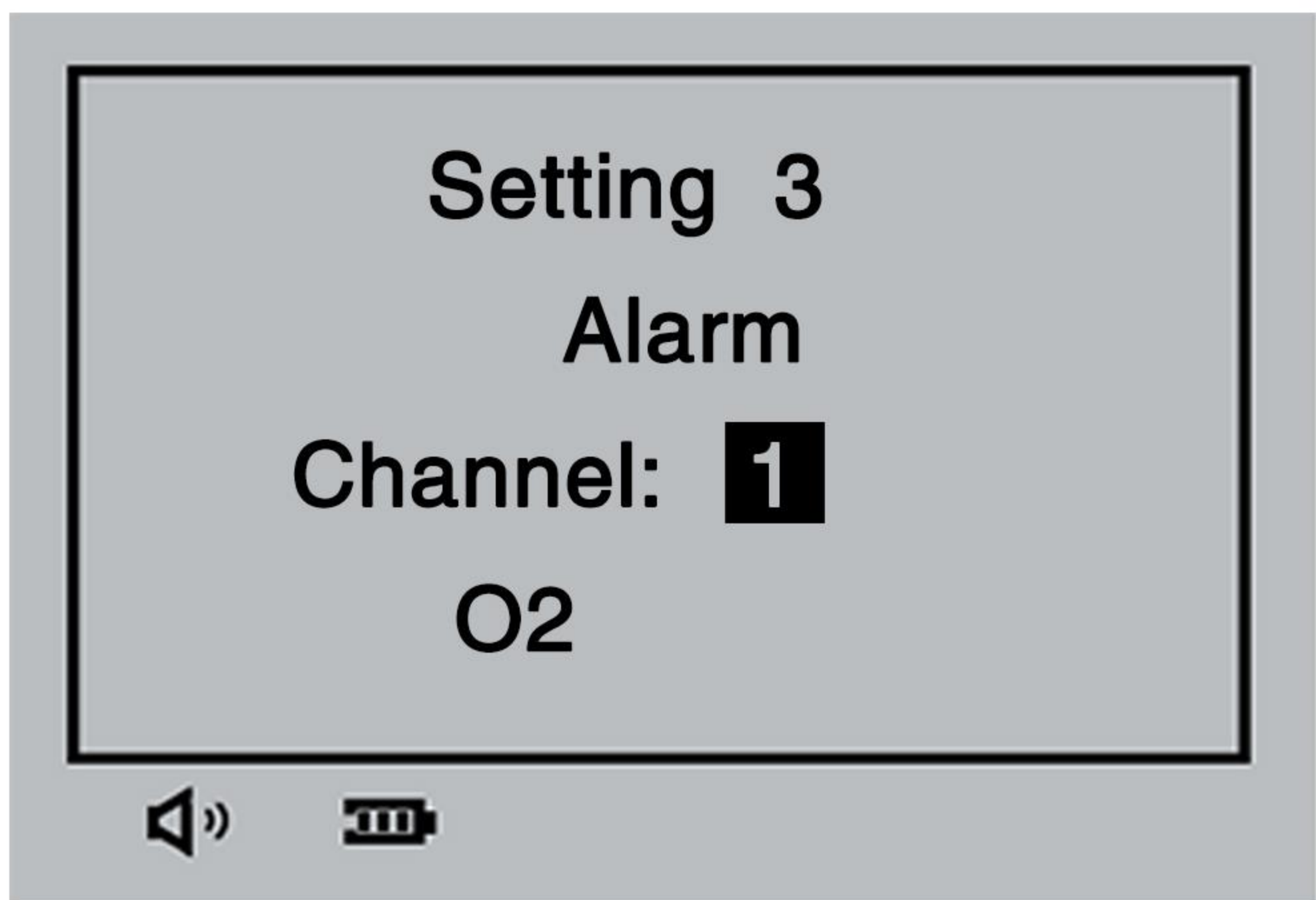


Figure 8

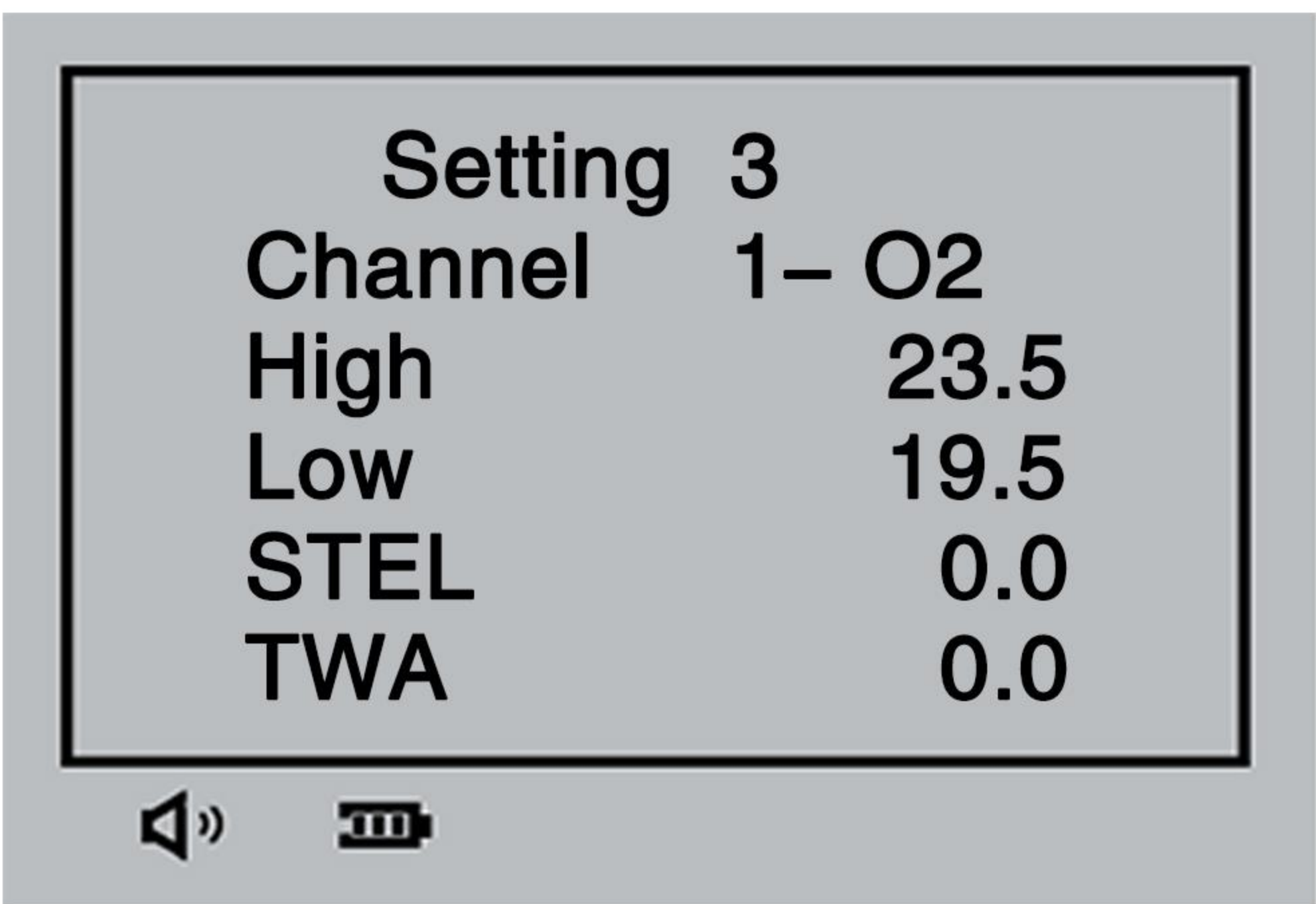


Figure 9

You can select the channel to be configured by pressing the "▲" (up) or "▼" (down) buttons, then press the "①" button to confirm and proceed to Figure 9.

After entering Figure 9, you can increase or decrease the value by pressing the "▲" or "▼" buttons, and press "①" to set the next parameter.

After completing all settings, the configured parameters will be saved, and you will return to Figure 2.

The settings for channels 3 and 4 can be configured using the same method.

3.4.2.4 Restore Parameter Settings

In the current state shown in Figure 2, press the "▼" (down) button to scroll through the menu until you reach the screen shown in Figure 10. Select the "Restore Parameters" option, then press the "①" button to confirm and proceed to the screen shown in Figure 11.

3.4.2.5 Channel Parameter Settings

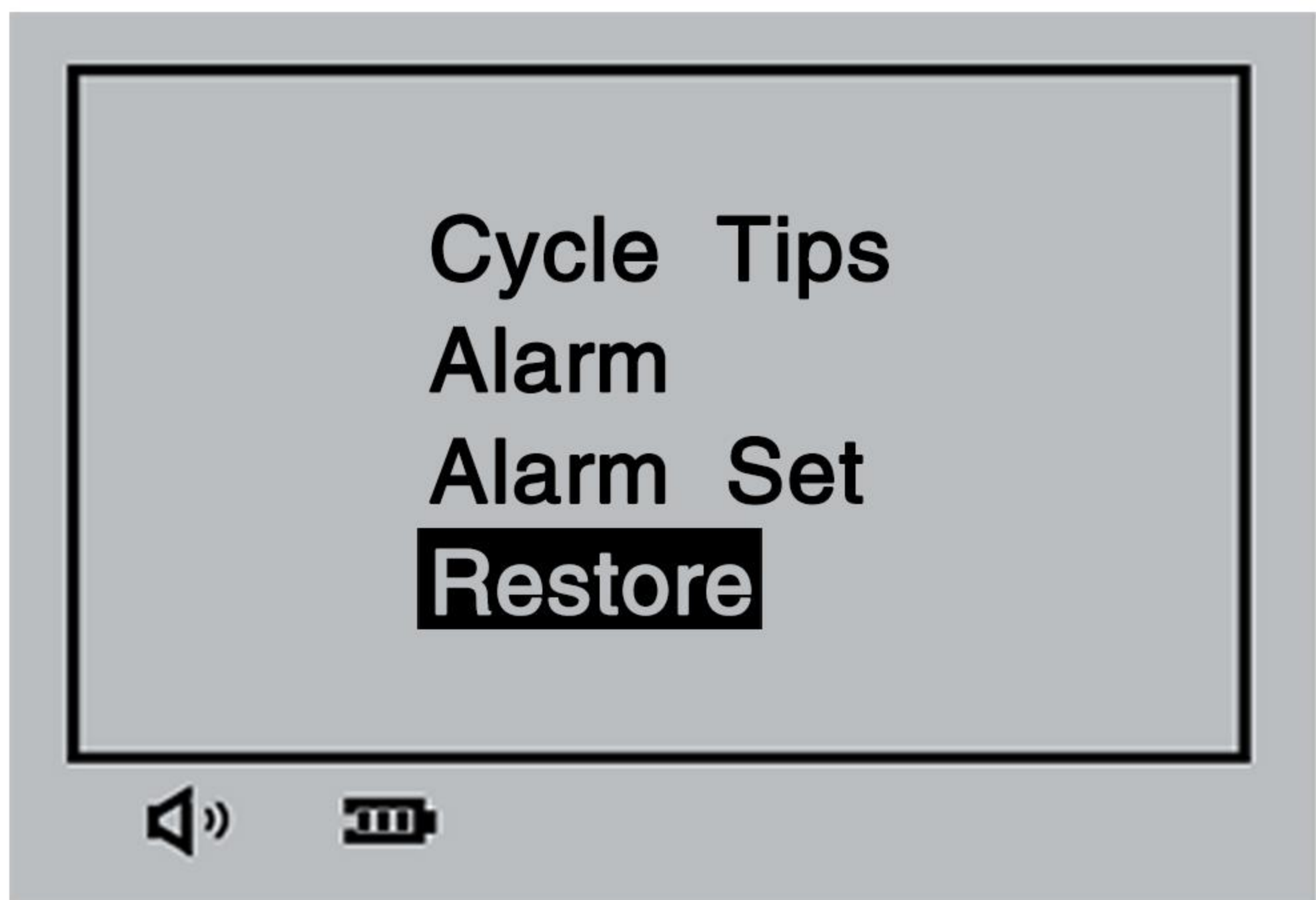


Figure 10

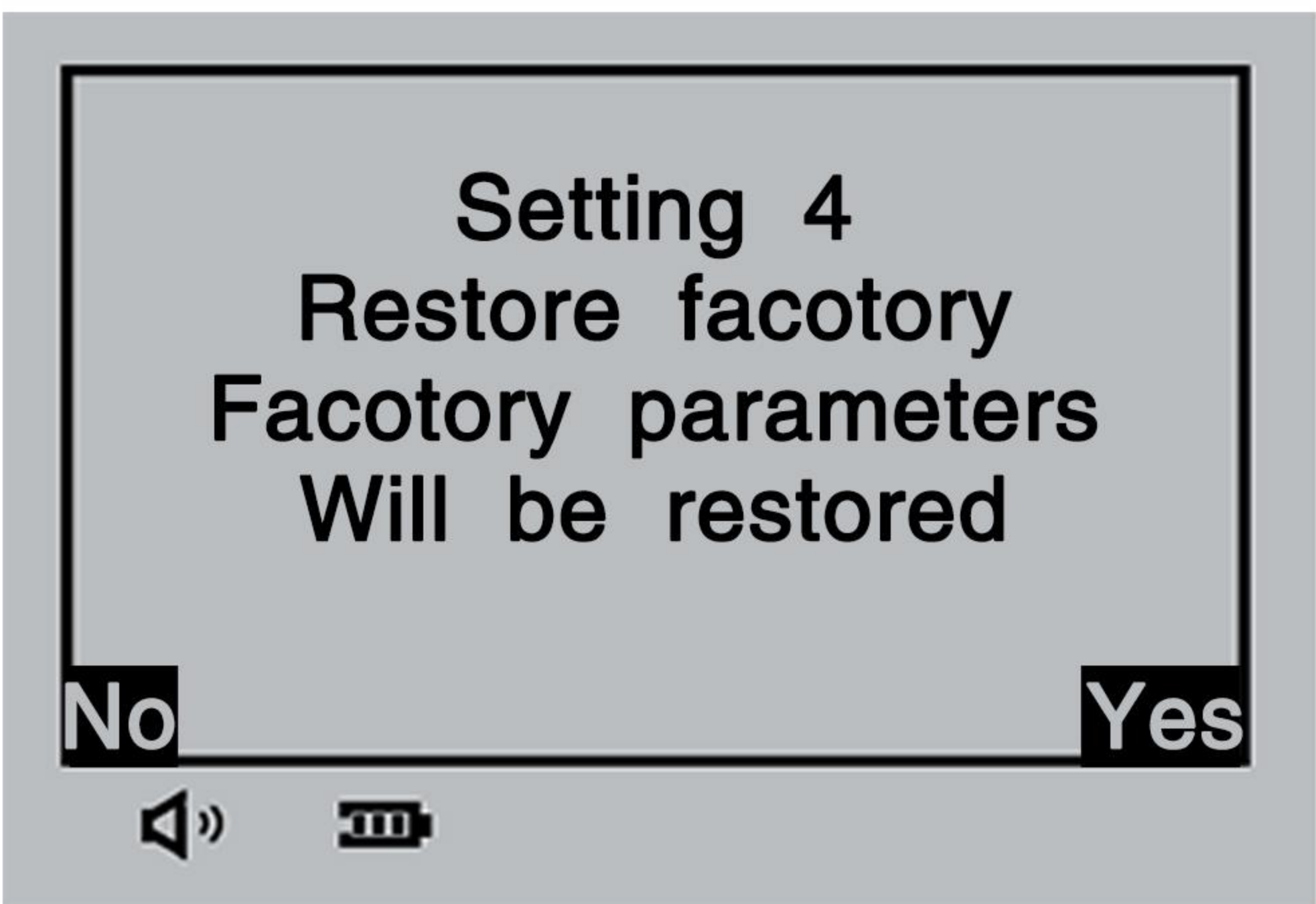


Figure 11

Press "ⓘ" to confirm, save, and return to the previous menu.
Press "Ⓜ" to return to the previous menu without saving.

3.4.2.6 Exit Parameter Setting Mode

In the parameter setting mode, press "Ⓜ" to return to Figure 12.

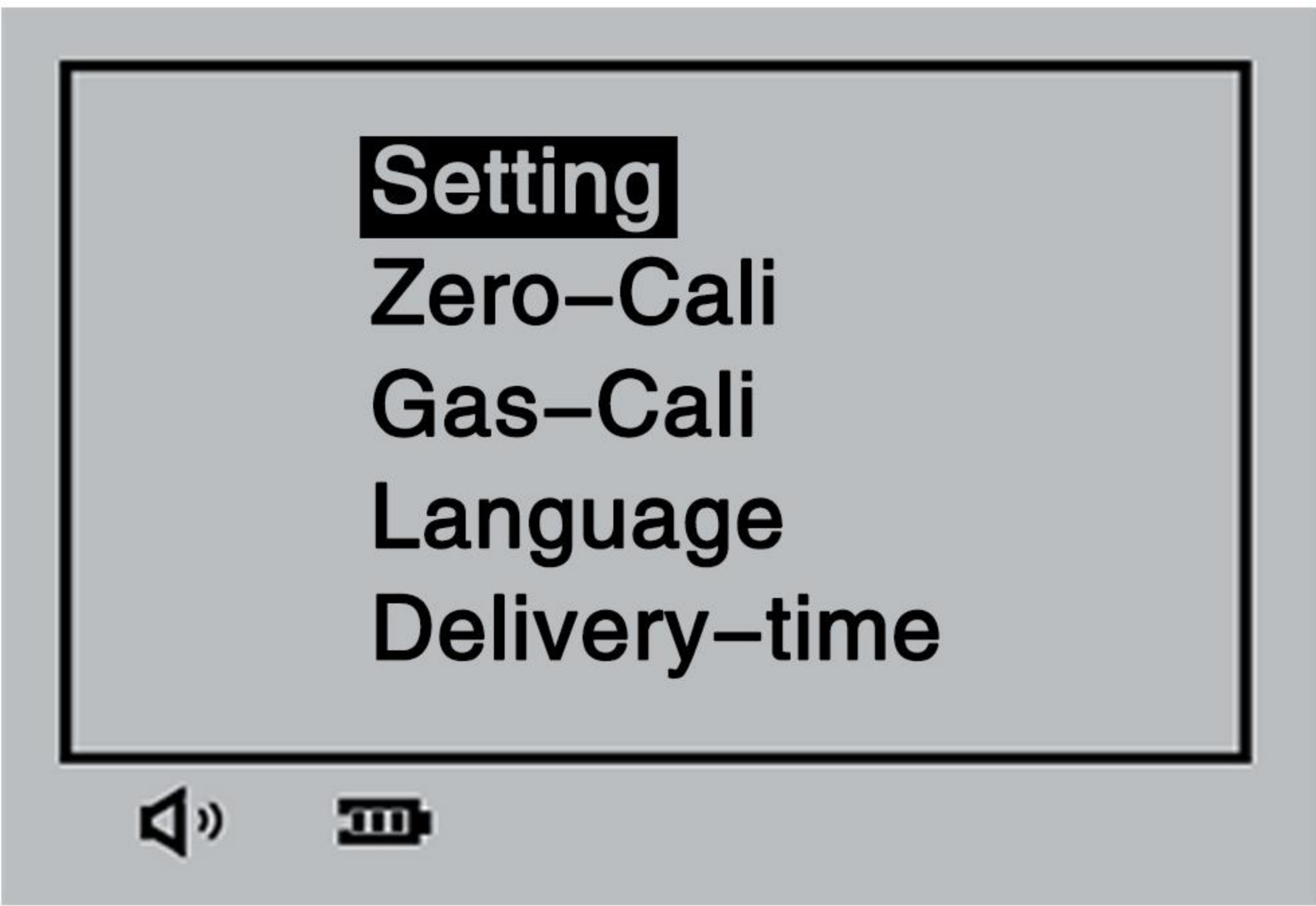


Figure 12

4. Calibration Menu

The instrument has been calibrated and qualified at the factory, and no user calibration is required. If the instrument has been in use for a period of time and you deem it necessary to readjust it, you can refer to this chapter for instrument calibration. The calibration work must be performed by a professional or trained instrument operator.

4.1 Zero Calibration (For oxygen, it is sensitivity calibration with a value of 20.9%VOL)

Zero calibration must be performed in clean air. It is recommended to perform zero calibration once a day or after an alarm occurs. Zero calibration must be performed in clean air. It is recommended to perform zero calibration once a day or after an alarm occurs.

In the state shown in Figure 1, use the "▲" or "▼" keys to select the "Zero Calibration" option (see Figure 13), then press "Ⓢ" to enter Figure 14. Use "▲" or "▼" to select "Start" or "Abort". If you select "Start", press "Ⓢ" to enter the interface shown in Figure 15. The instrument will emit a sound prompt and enter a 20-second countdown. After the 20 seconds are completed, the result shown in Figure 16 will be displayed.

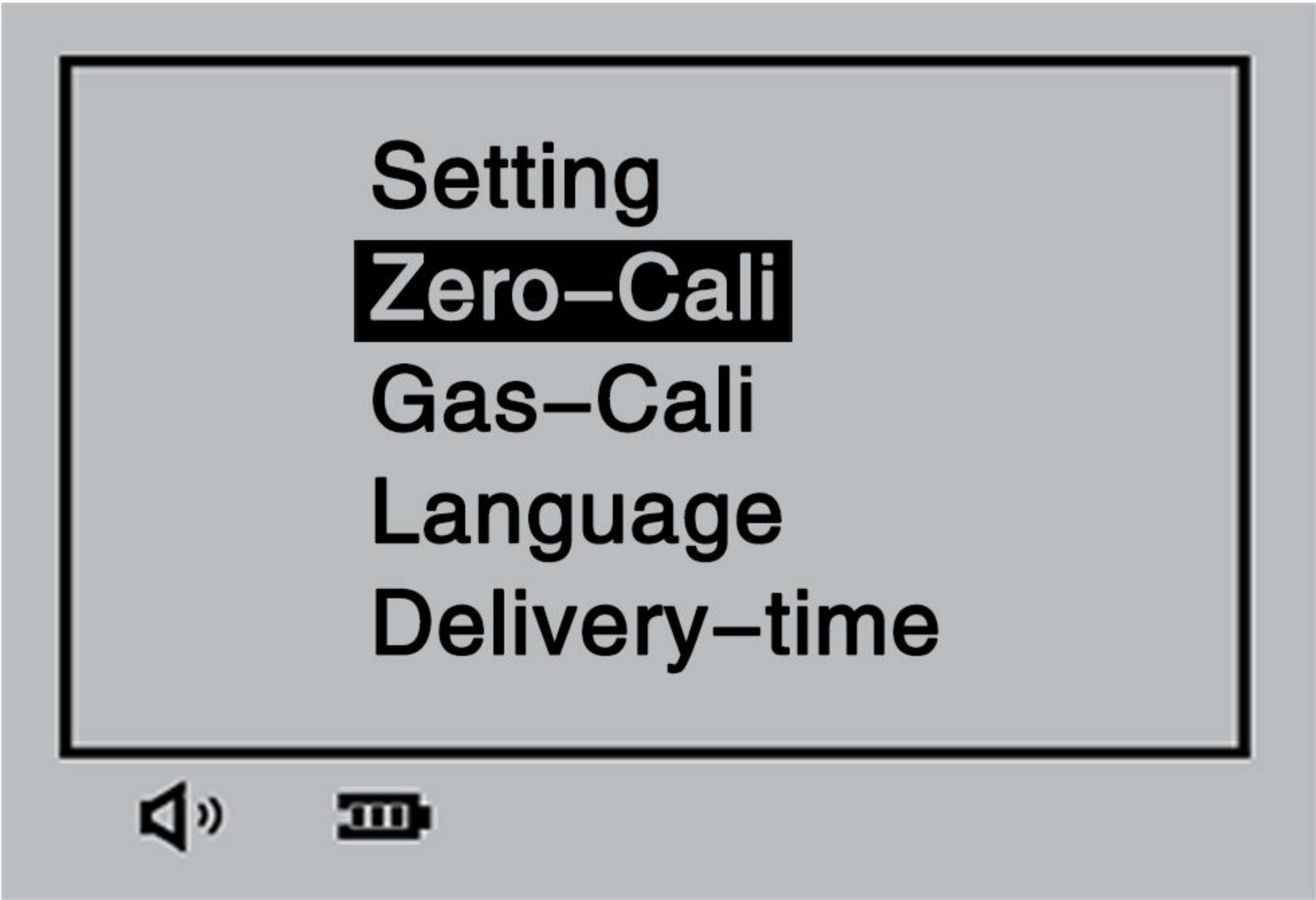


Figure 13

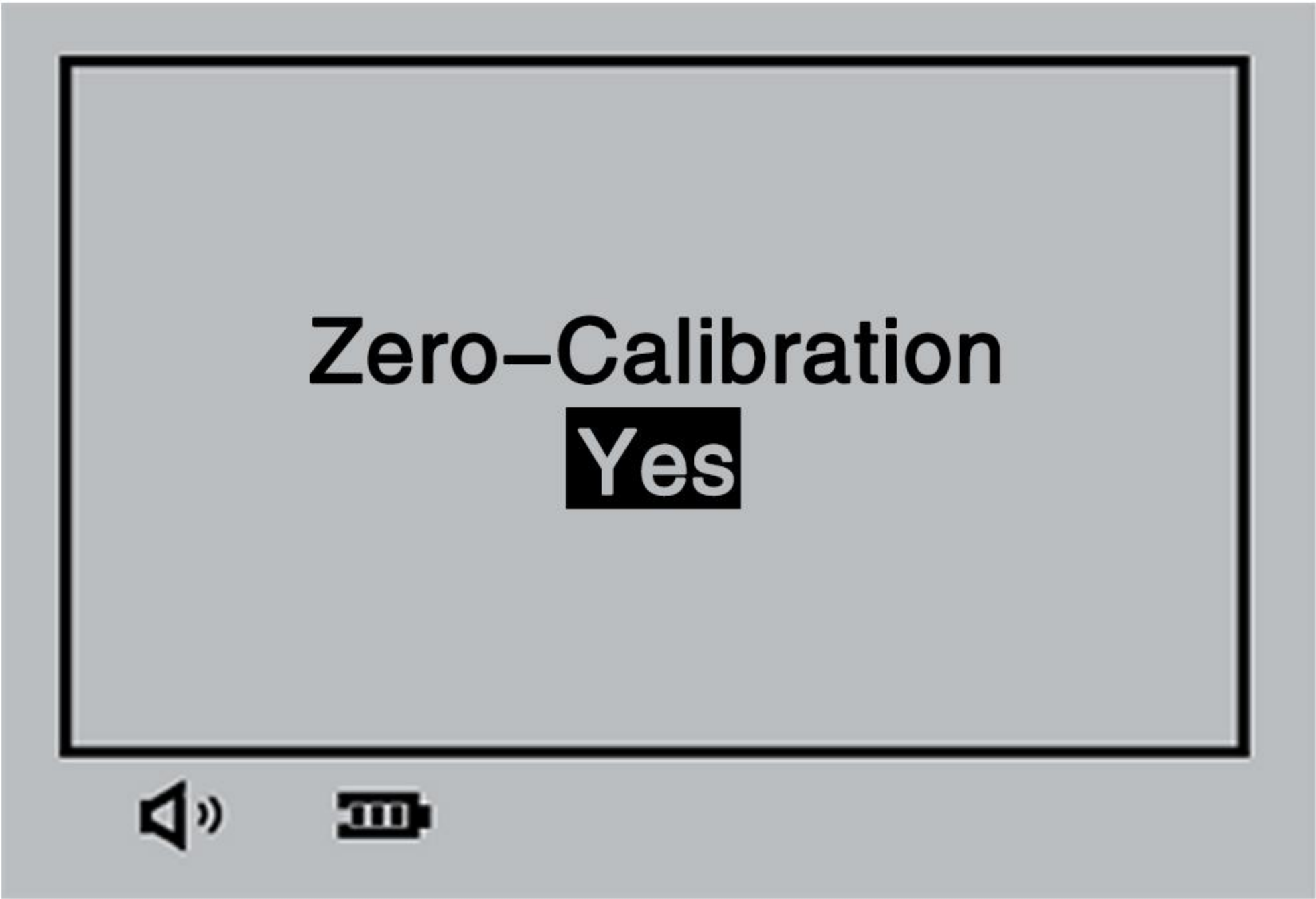


Figure 14

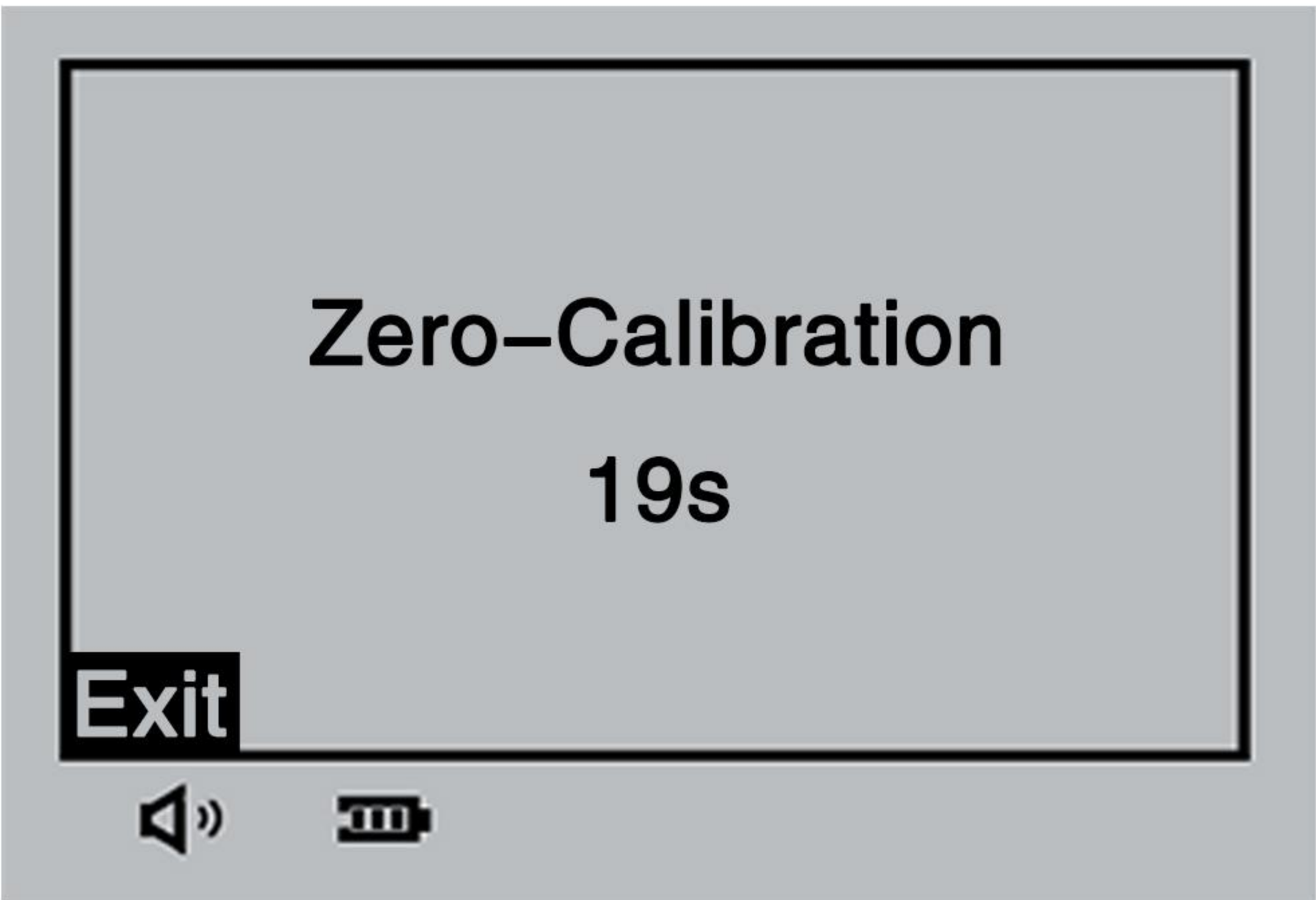


Figure 15

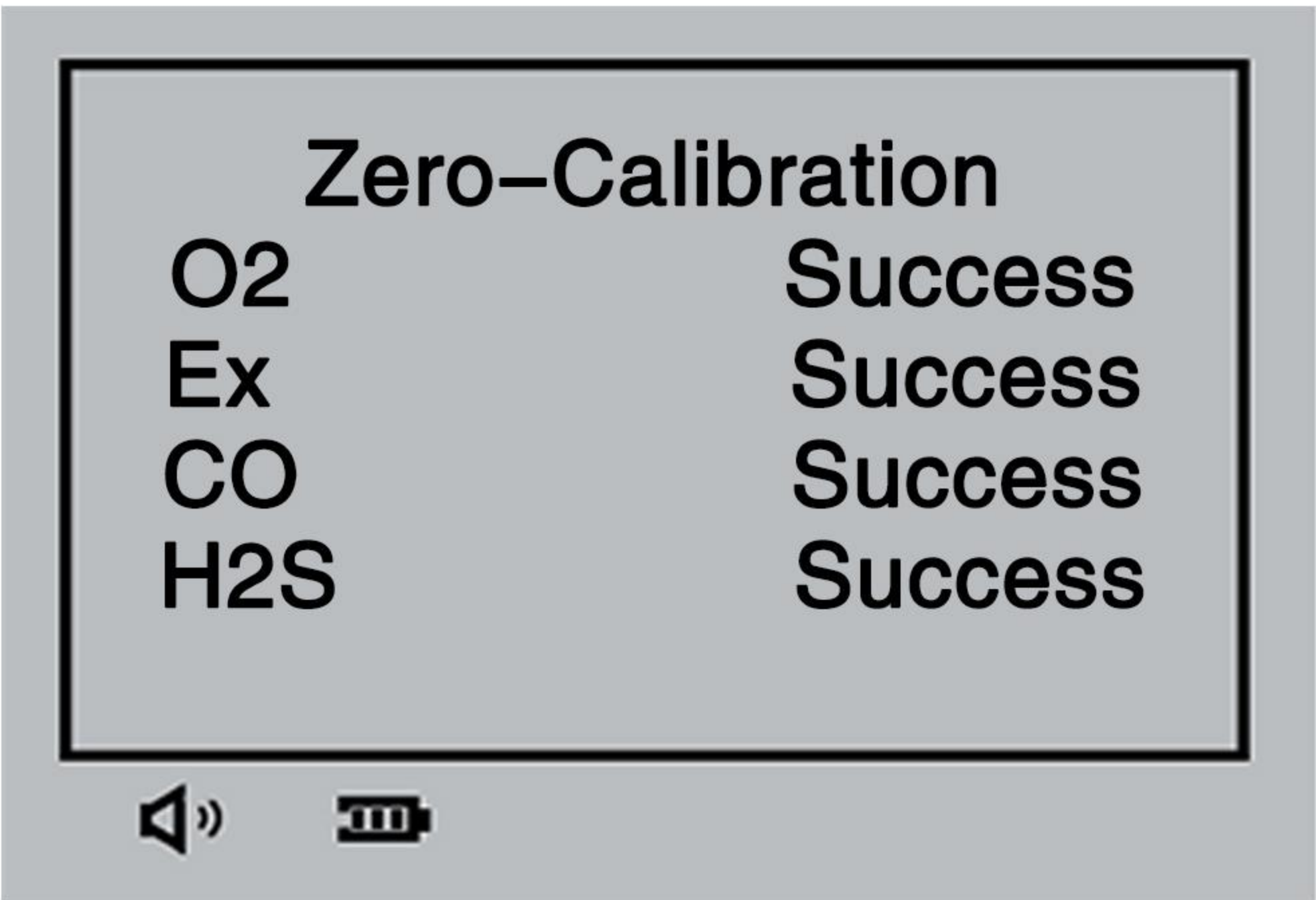


Figure 16

If the calibration of a channel fails, a failure message will be displayed. The possible reasons include a loose sensor in this channel or the zero-point AD value not meeting the factory settings. In such cases, the instrument needs to be returned to the factory for inspection.

Note: If any sensor fails the calibration, please re-perform the zero-point calibration in clean air. If it fails again, please contact us or your local agent/service provider.

4.2 Gas Calibration

For gas sensors, sensitivity calibration should be performed at least every 6 months. For users, at least one standard gas should be used to calibrate one sensor.

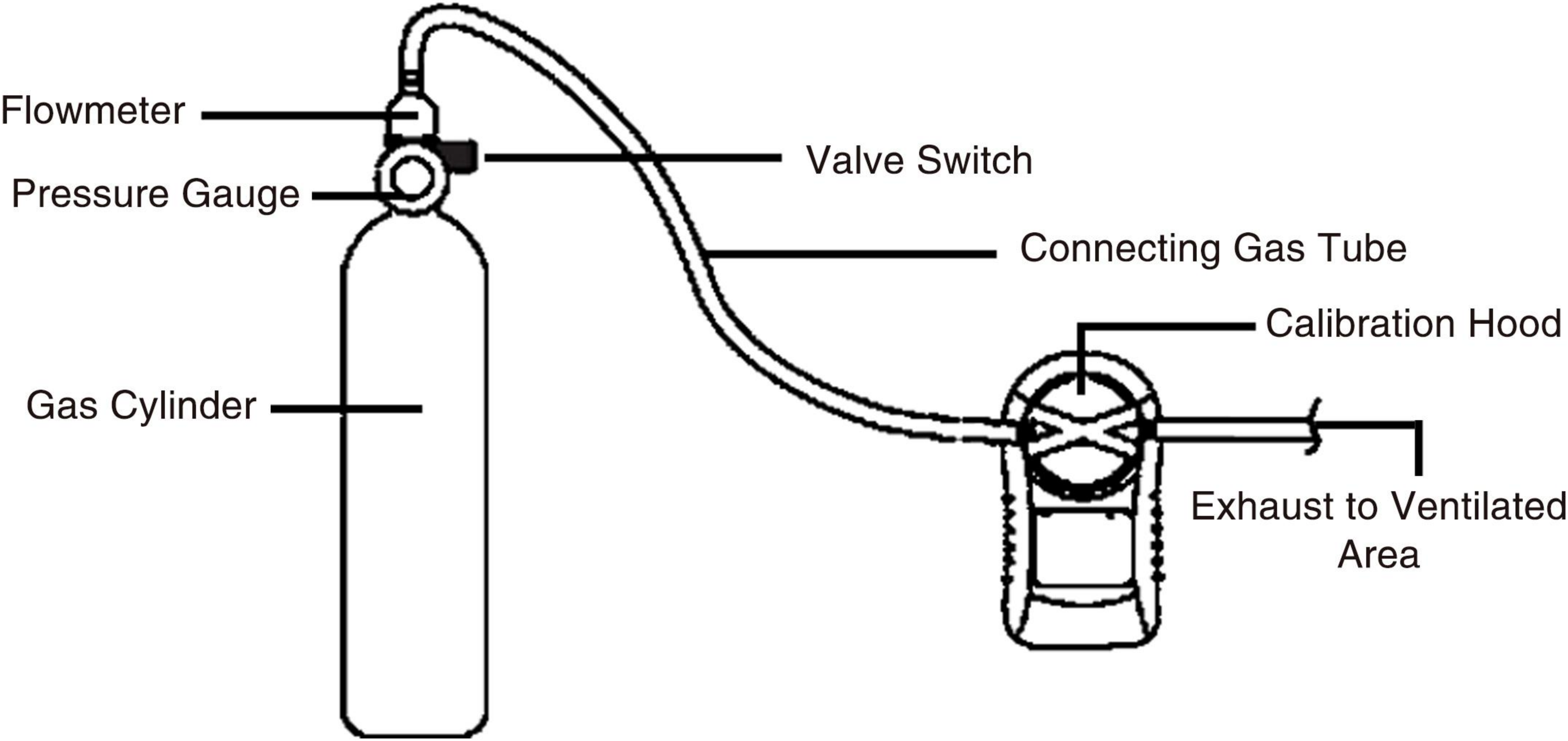
When performing sensitivity calibration, the operator requires the following calibration tools:

- A standard gas cylinder with a known concentration

Gas Type	Recommended Standard Gas Concentration
CH ₄	50%LEL
O ₂	18.0%
CO	700ppm
H ₂ S	50ppm
Other Gases	Negotiate by telephone

- For the flowmeter and pressure reducing gauge, the recommended flow rate is 300mL to 500mL per minute.

- A connecting tube is installed between the pressure reducing valve and the calibration gas cylinder.



- Before performing sensitivity calibration, the zero calibration must be completed first.

4.2.1 Gas Calibration Operation

Open the cylinder valve, set the flowmeter to a value between 300ml/min and 500 ml/min, connect the hose to the calibration hood, and allow the gas to flow for more than 90 seconds.

● In the state shown in Figure 1, use the "▲" or "▼" keys to select the "Gas Calibration" option (see Figure 17), then press "①" to enter Figure 18.

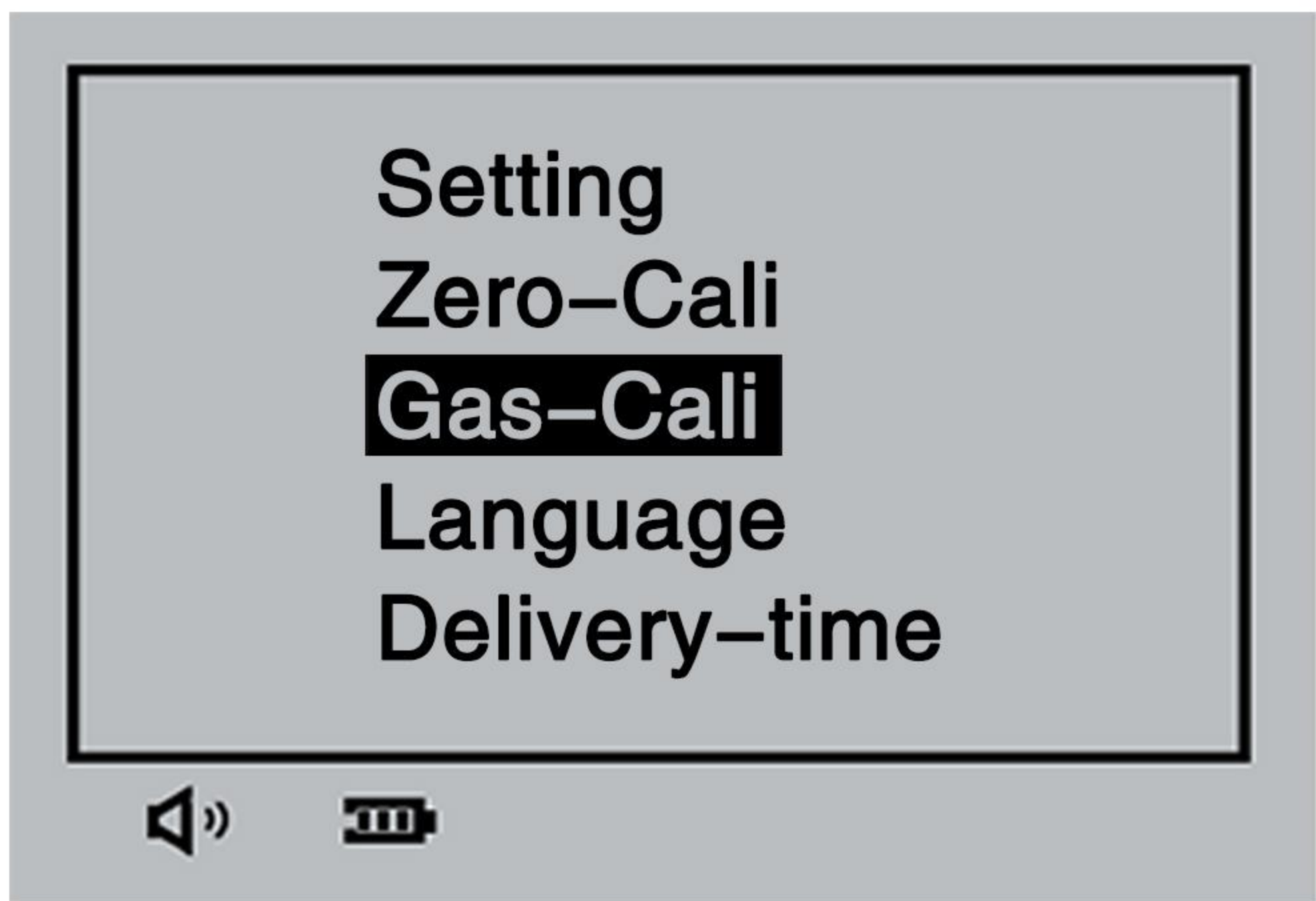


Figure 17

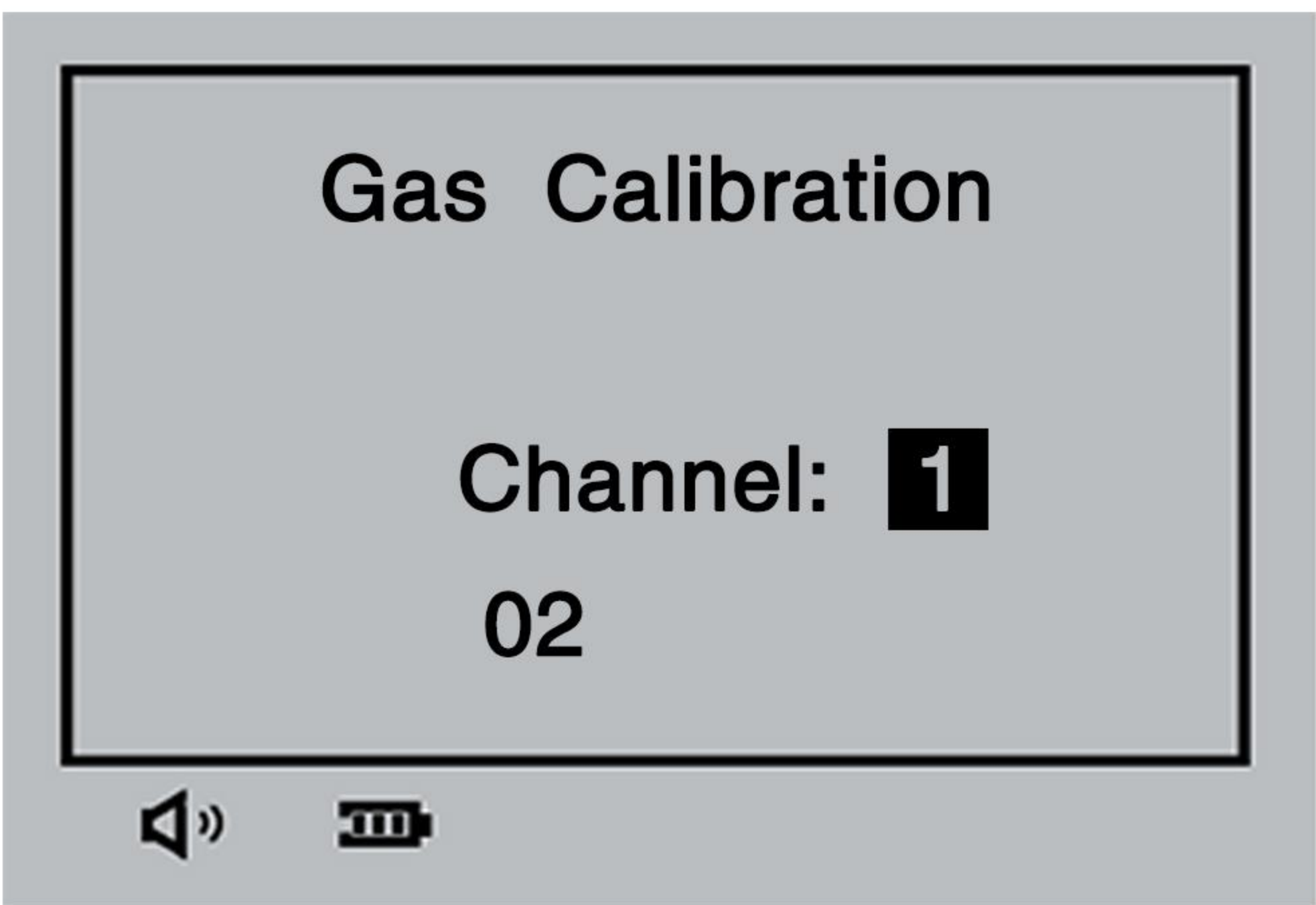


Figure 18

● Use the "▲" or "▼" keys to select the channel to be calibrated (the oxygen channel is used as an example below), then press "①" to enter the interface shown in Figure 19.

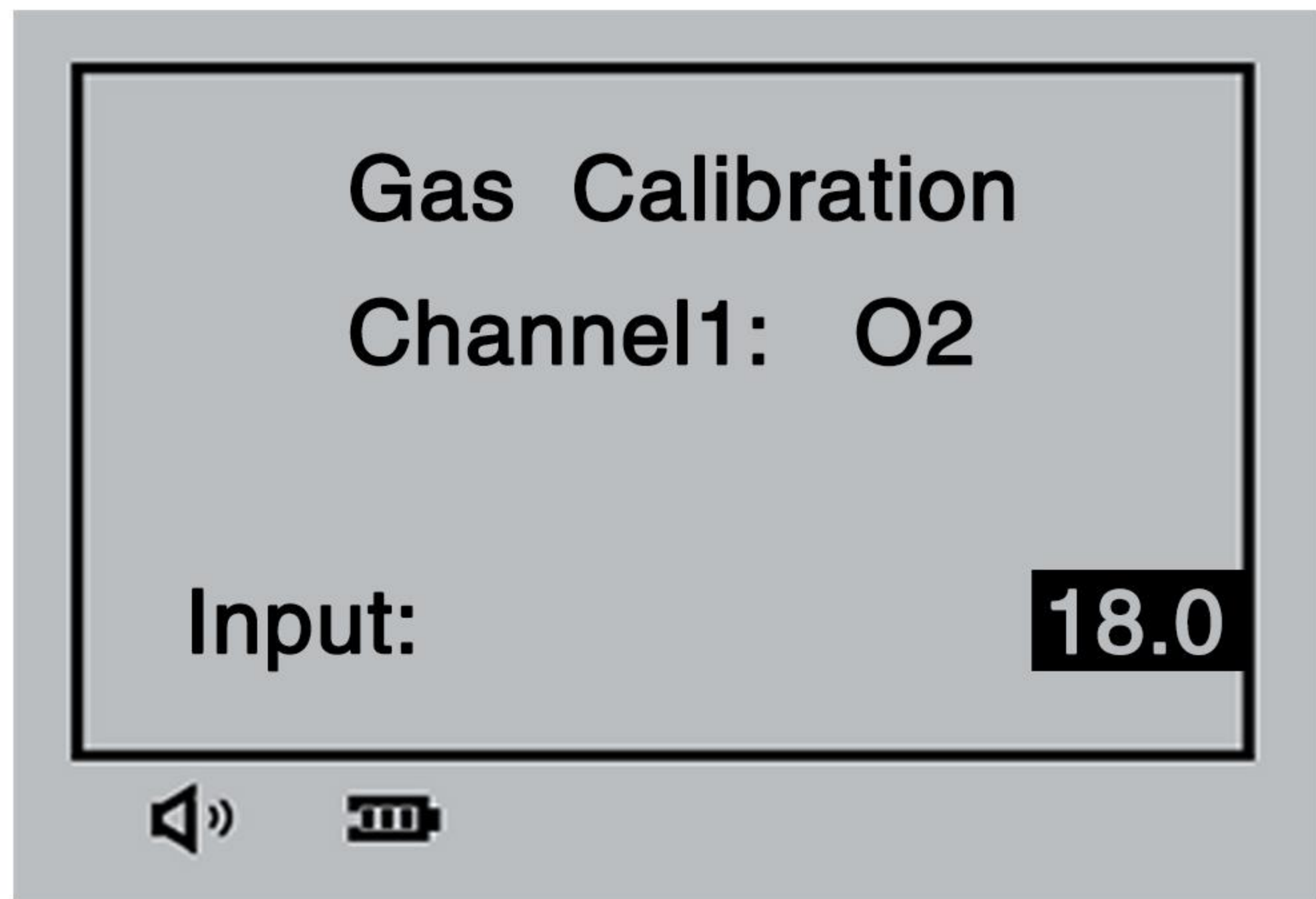


Figure 19

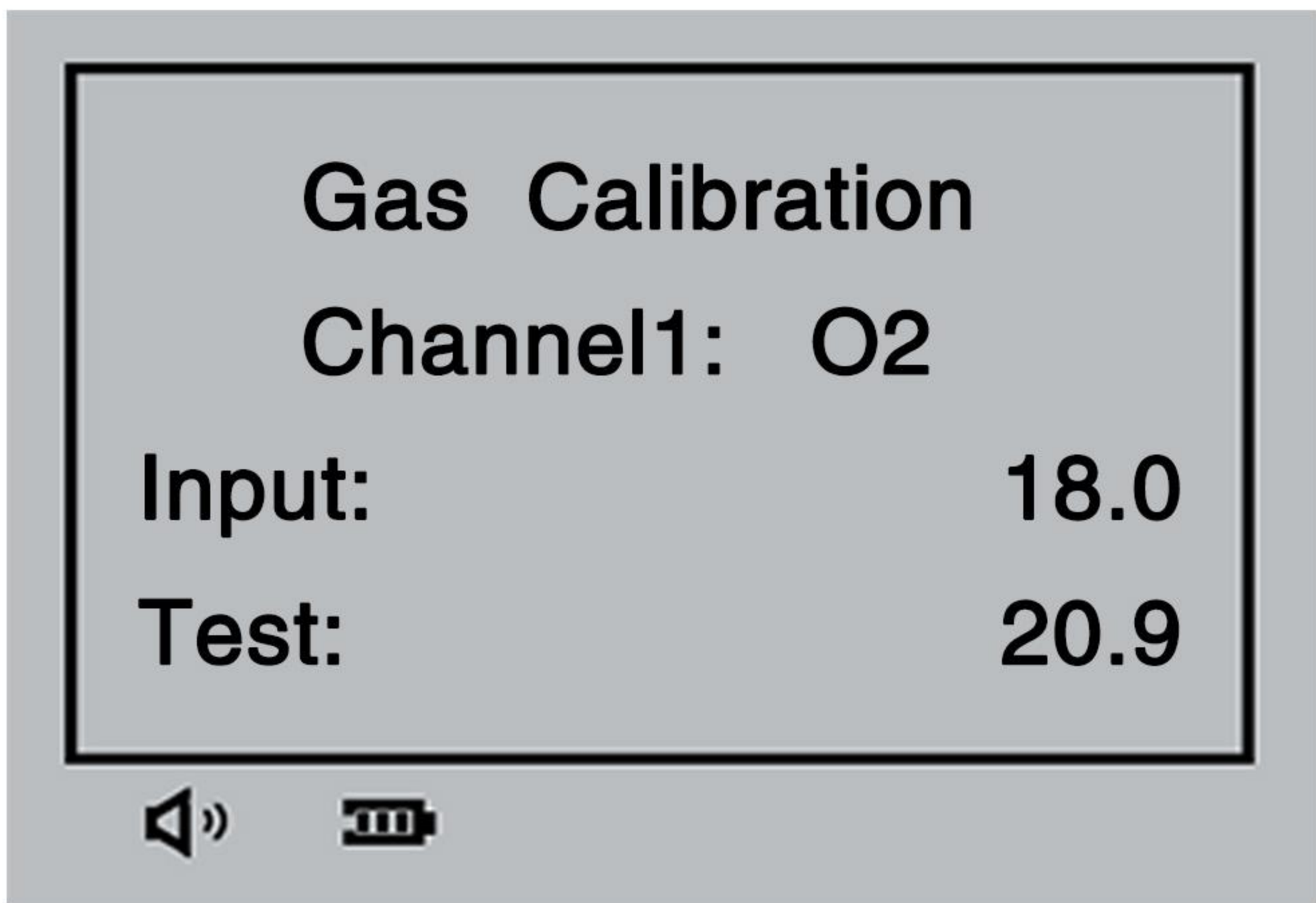


Figure 20

● If you need to modify the current value, use the "▲" or "▼" keys to adjust the value to match the concentration of the calibration gas. Press "①", and the instrument will enter the automatic calibration process, which takes approximately 50 seconds.

- If no standard gas is introduced or the sensor is faulty, the prompt shown in Figure 21 will appear.
- If the calibration is successful, the prompt shown in Figure 22 will appear.

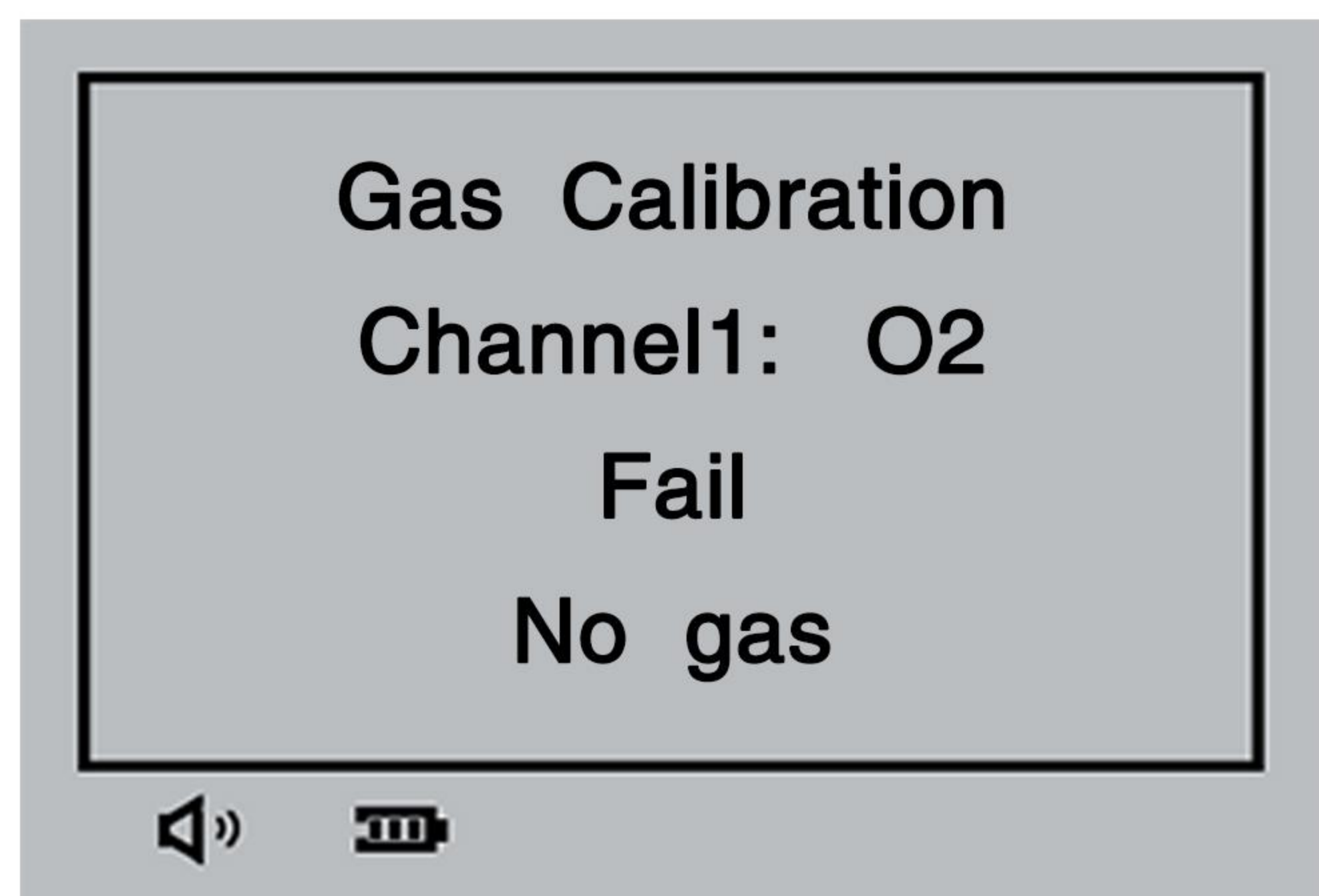


Figure 21

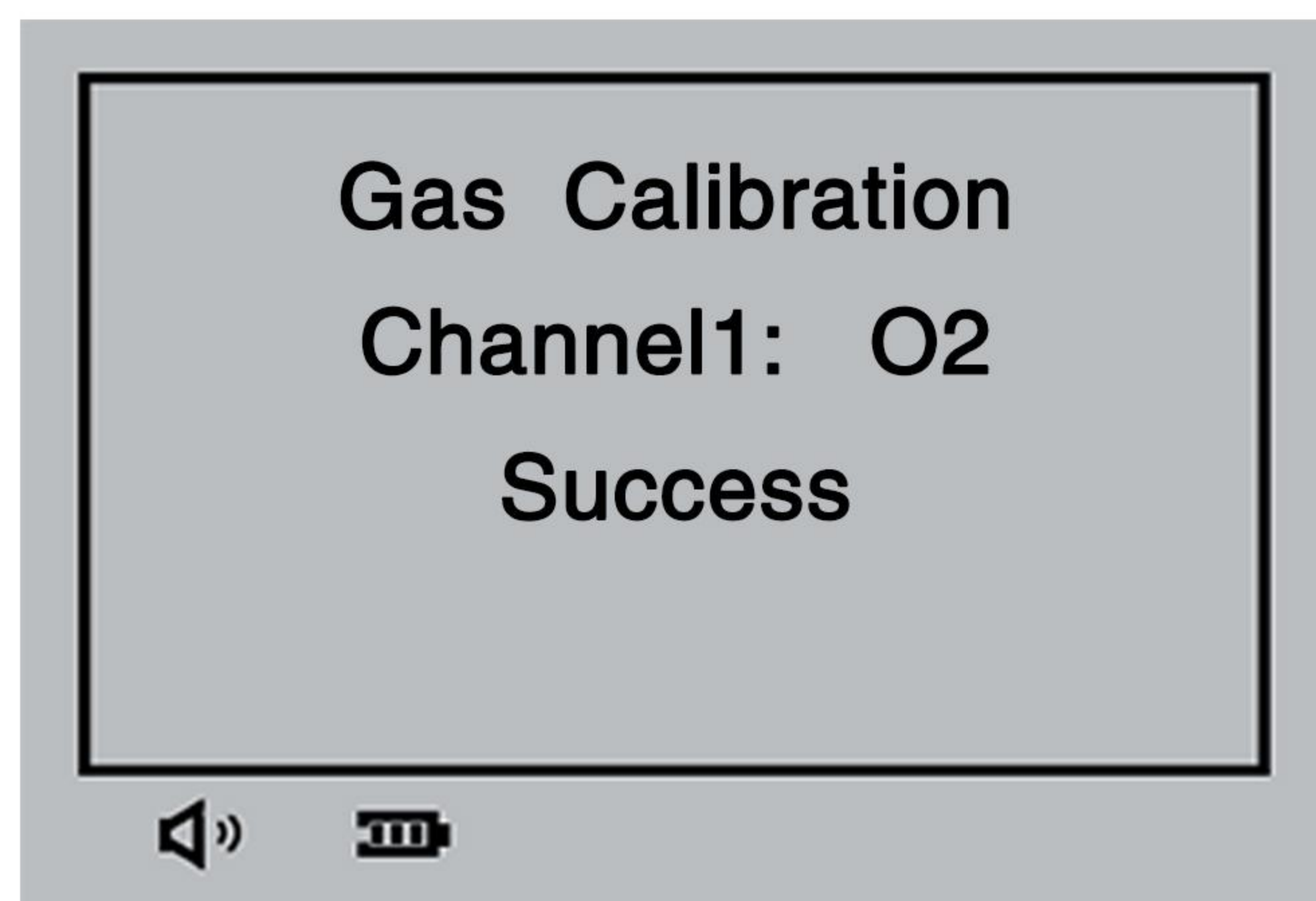


Figure 22

Note: If any sensor fails the calibration, please re-perform the sensitivity calibration. If it fails again, please contact us or your local agent/service provider.

4.3 Storage Settings (Only for models with storage function)

- In the state shown in Figure 1, use the "▲" or "▼" keys to select the "Storage Settings" option (see Figure 23).

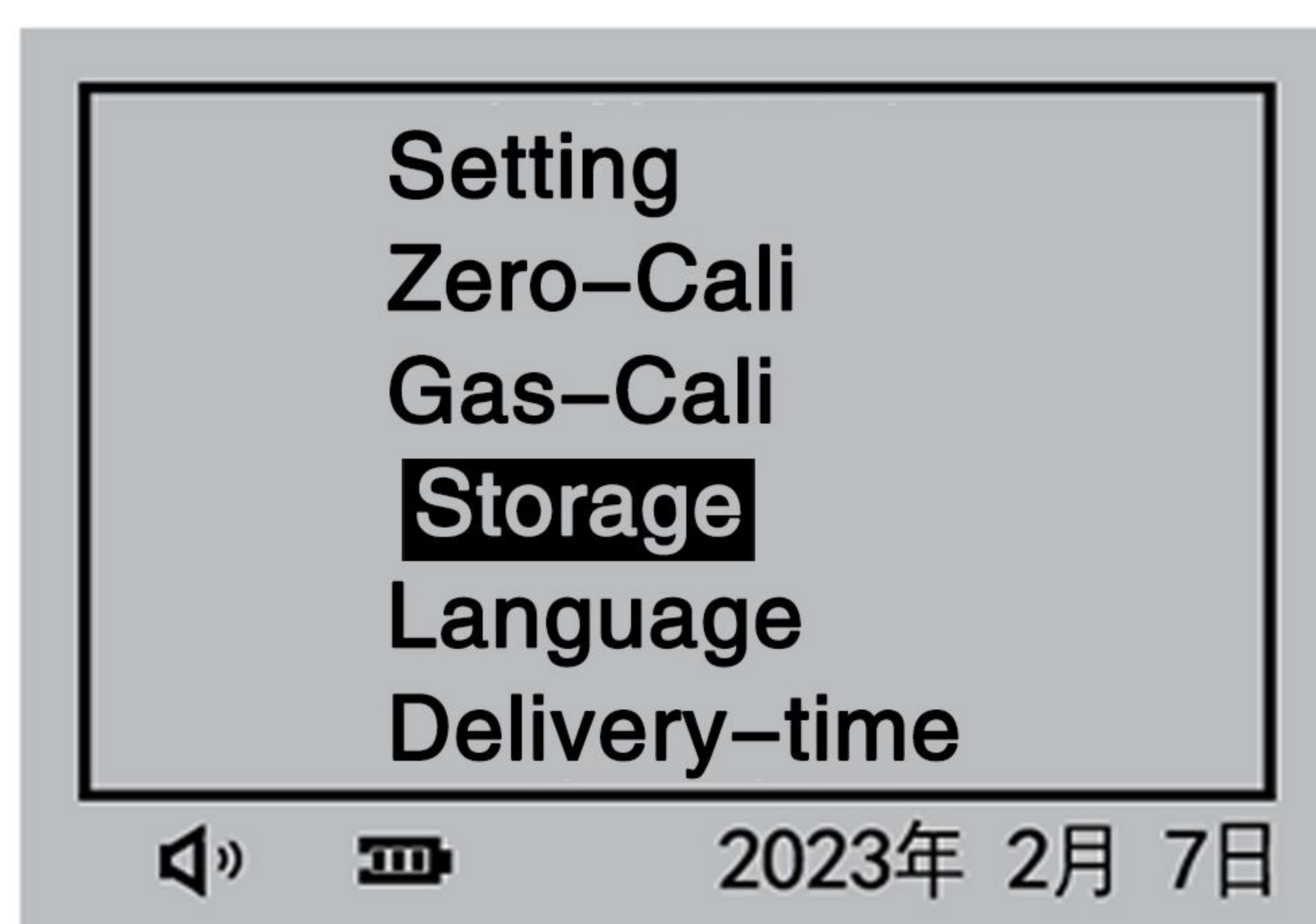


Figure 23

● Press "①" to enter Figure 24. Use the "▲" or "▼" keys to select "Time Settings", then press "①" to enter Figure 25. Use "▲" or "▼" to adjust the values, and press "①" to enter the next value setting. After all settings are completed, return to Figure 24.



Figure 24



Figure 25

● In the state shown in Figure 24, use the "▲" or "▼" keys to select the "Record" option, then press "①" to enter Figure 27. Use the "▲" or "▲" keys to scroll through the data, and press "Ⓜ" to return to Figure 26.



Figure 26



Figure 27

● In the state shown in Figure 24, use the "▲" or "▼" keys to select the "Clear Records" option (see Figure 28), then press "①" to enter Figure 29. Use "▲" or "▼" to select "Start" or "Abort". If you select "Start", press "①" to enter the interface shown in Figure 30. After waiting a few seconds, the system will automatically return to Figure 28.

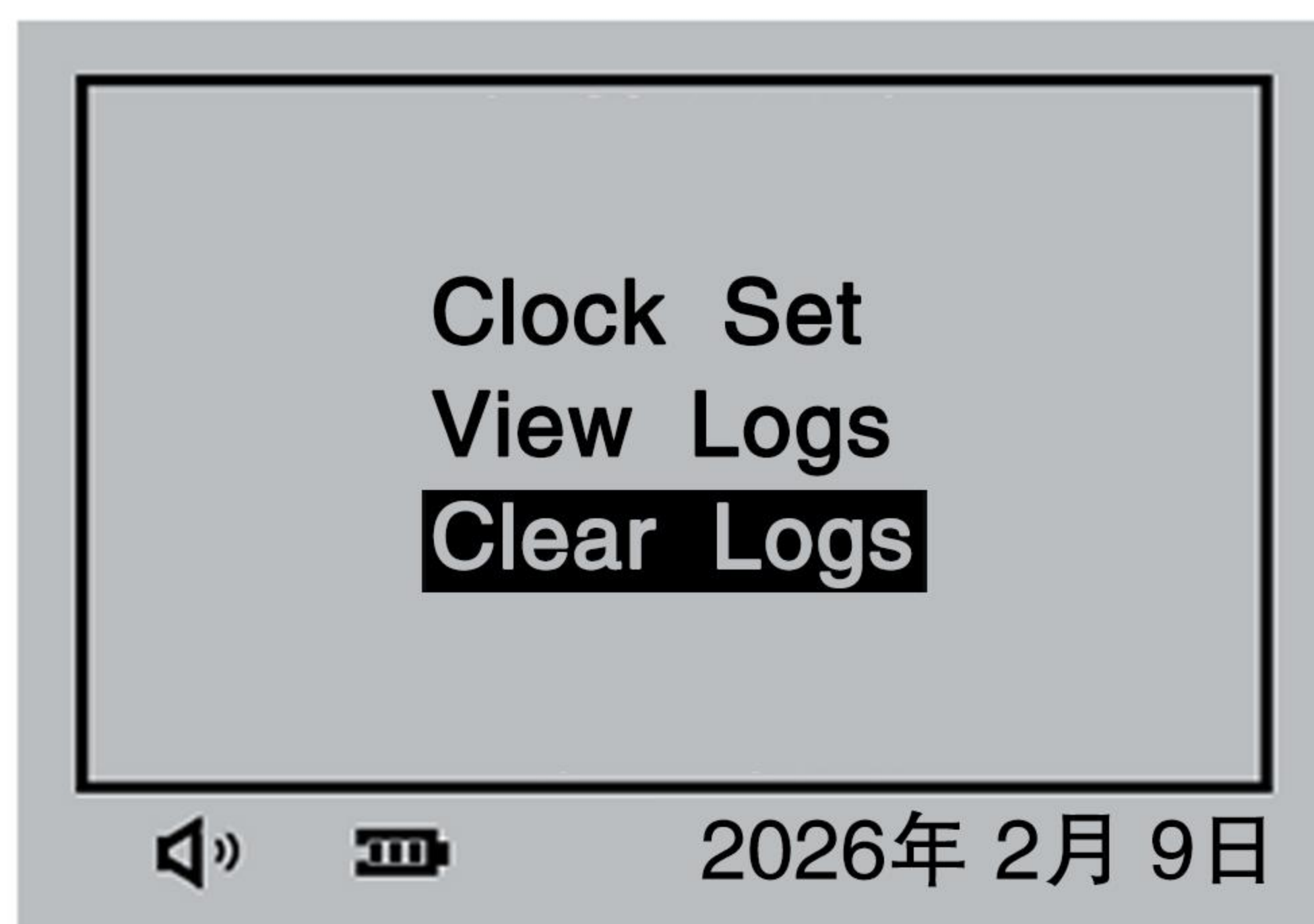


Figure 28

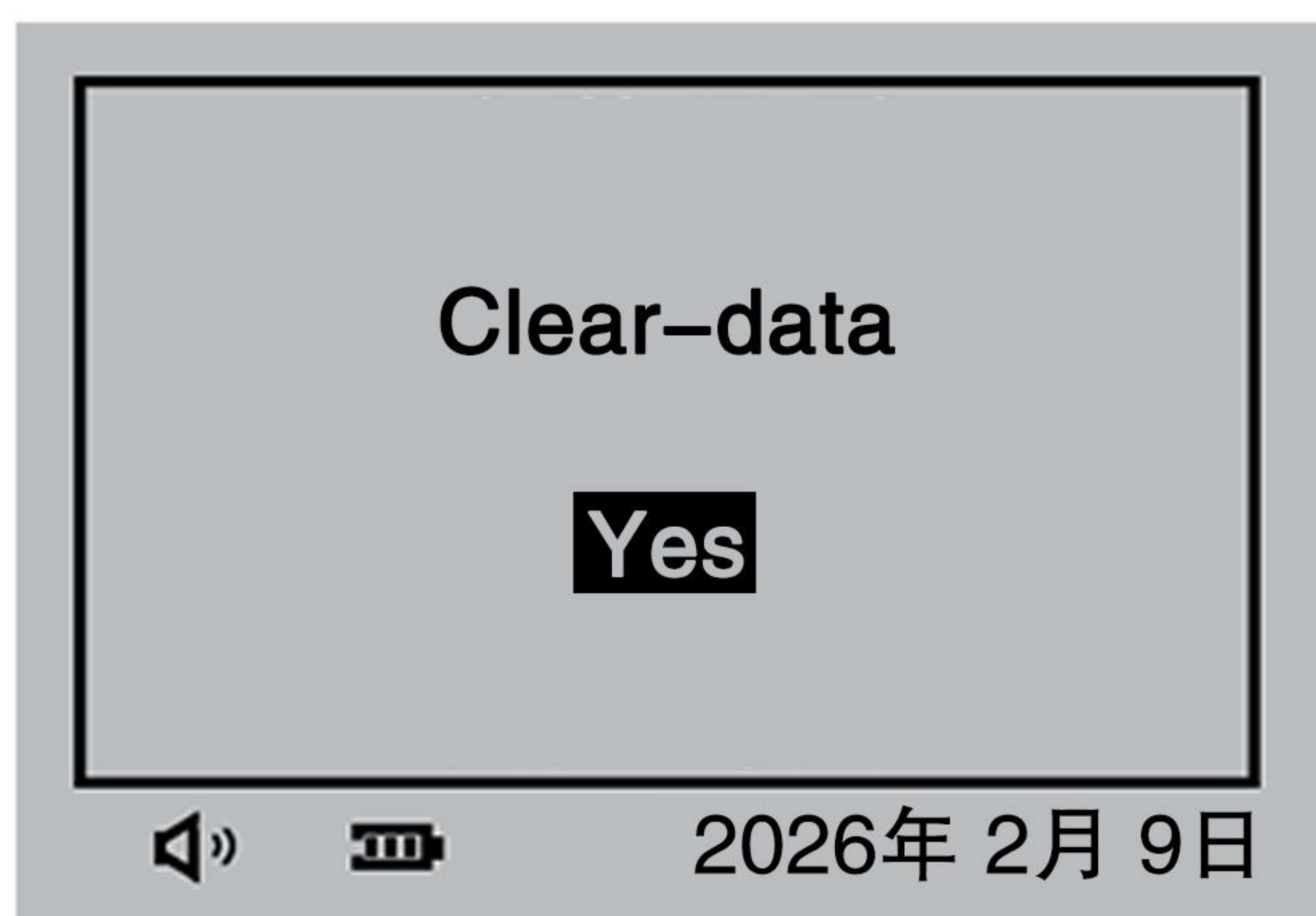


Figure 29



Figure 30

4.3 Language Selection

In the state shown in Figure 1, use the "▲" or "▼" keys to select the "Language Settings" option (see Figure 31), then press "Ⓢ" to enter Figure 32. Use "▲" or "▼" to select Chinese or English (see Figure 33), and press "Ⓢ" to save and return to Figure 31.

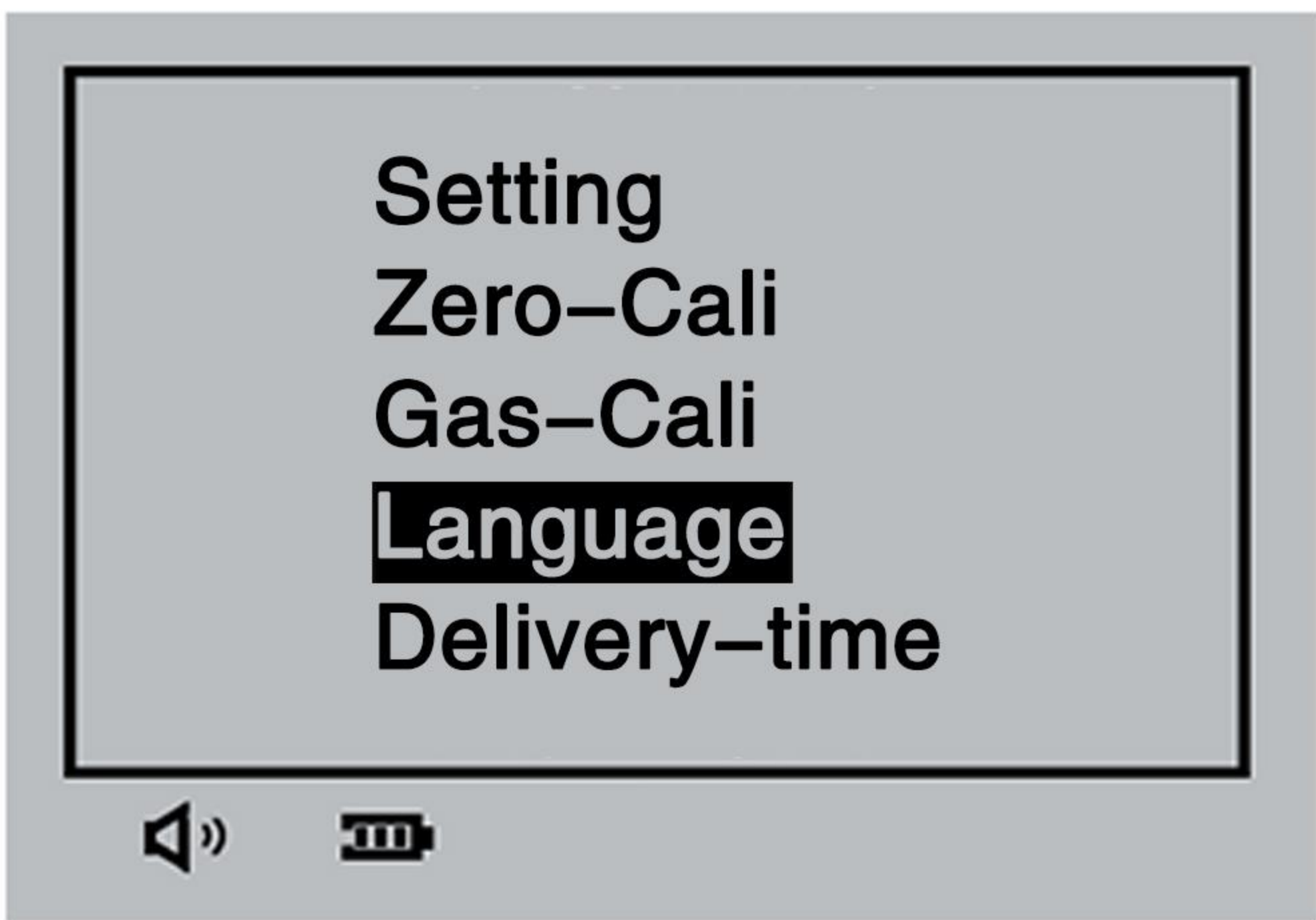


Figure 31

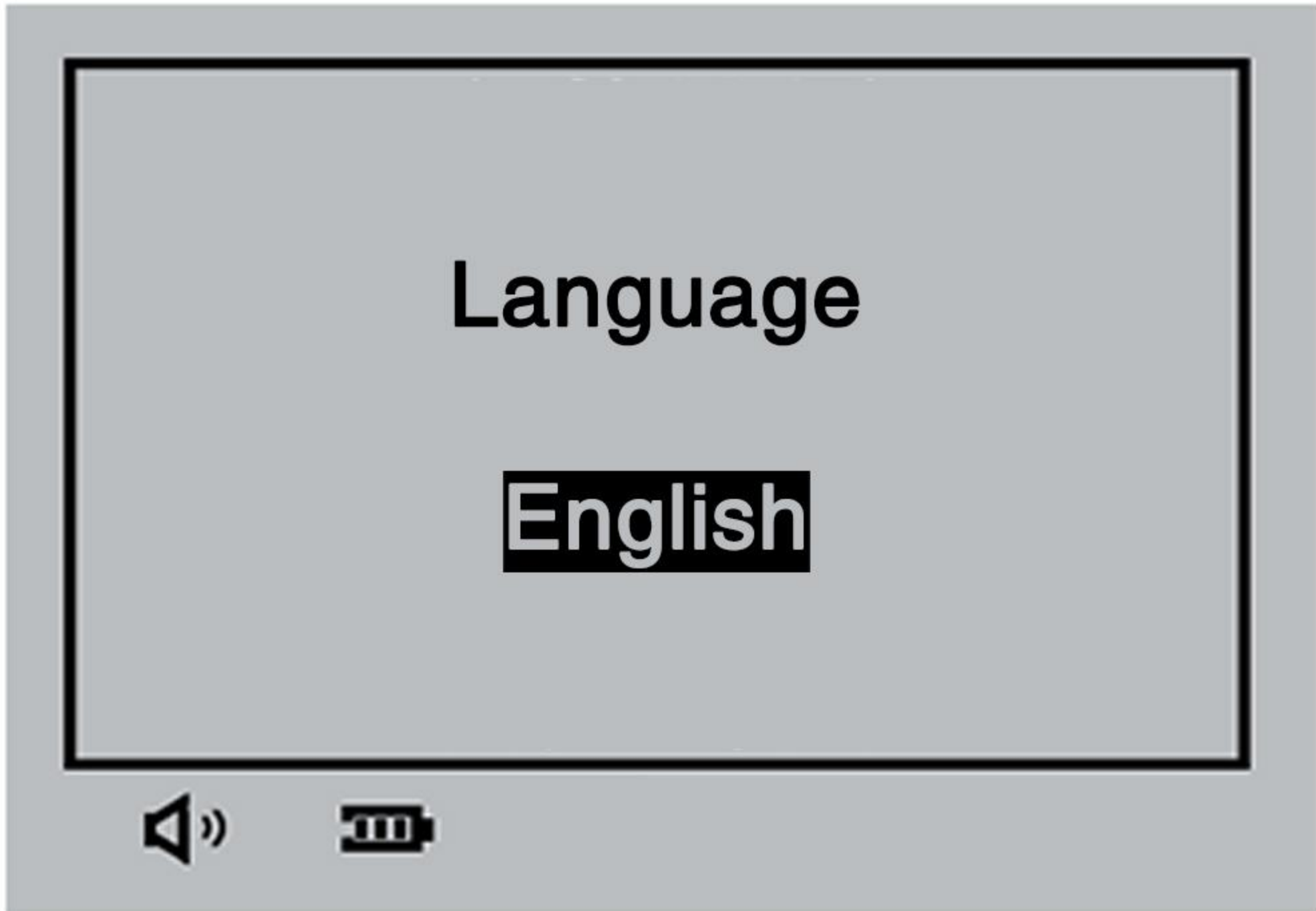


Figure 32



Figure 33

4.4 View Factory Time

In the state shown in Figure 1, press the "▼" key to scroll through the menu until you reach the interface shown in Figure 35. Select the "Factory Time" option, then press "①" to confirm and enter the interface shown in Figure 35.

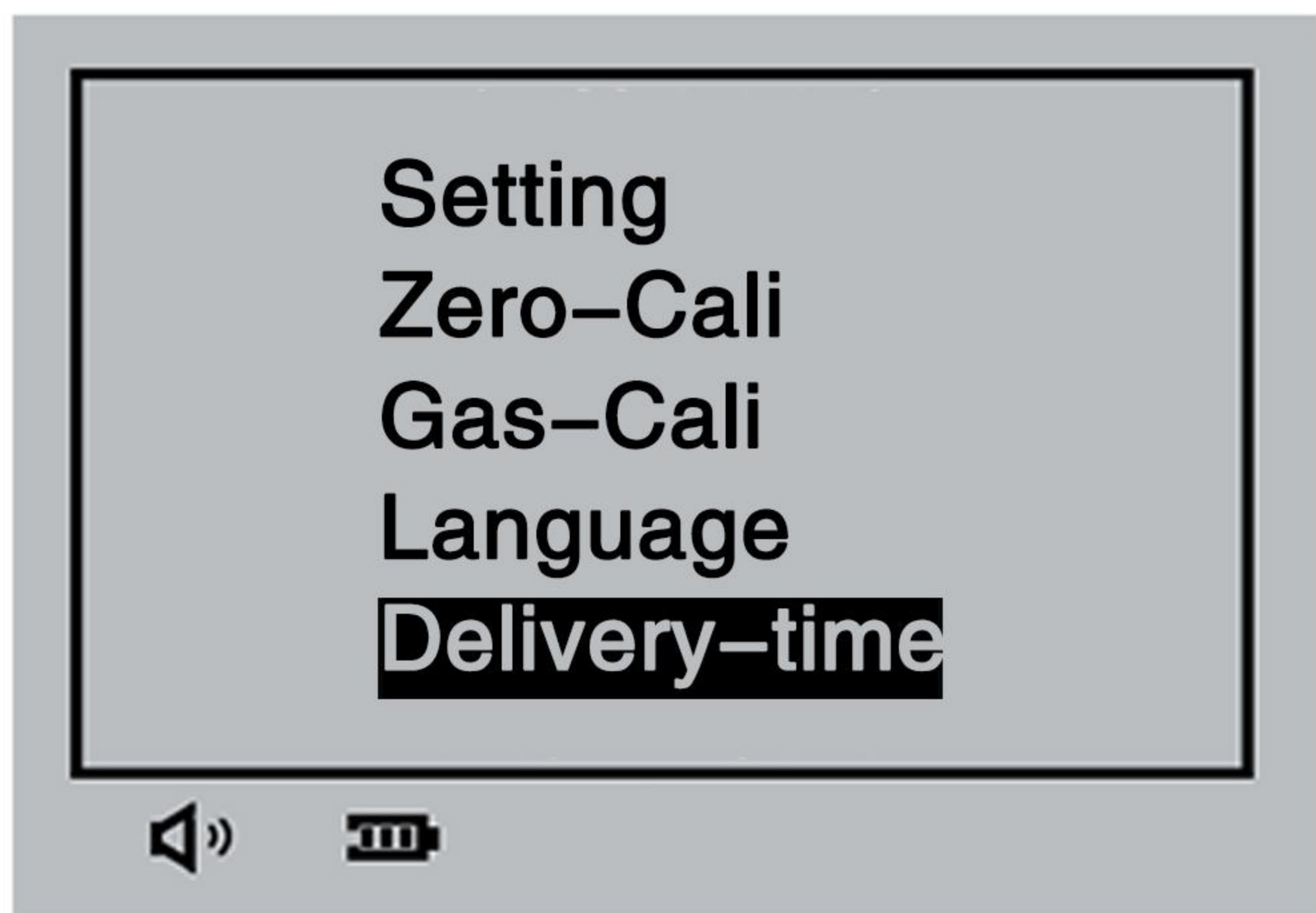


Figure 34



Figure 35

Press the "Ⓜ" key to return to Figure 34.

4.5 Exit Menu

In the states shown in Figure 1, Figure 13, Figure 17, Figure 23, Figure 31, and Figure 34, press the "Ⓜ" key to directly return to the detection state.

5. Daily Use and Maintenance

5.1 Before using the instrument, please read the operation manual in detail.

5.2 This instrument shall be used and maintained by personnel who have received certain training or specialized personnel.

5.3 The use of this instrument must strictly follow the rules determined by our company.

5.4 For the maintenance of the instrument and replacement of parts, original accessories from our company must be used, and the work must be completed by specially trained personnel.

5.5 Battery replacement or charging must be carried out in a safe place.

5.6 Please be careful to prevent the instrument from falling from a height or being subjected to severe vibration.

5.7 If the instrument display is abnormal and intermittent sounds are emitted, it is caused by low battery voltage, and it can be restored to normal after charging.

5.8 It is strictly prohibited to expose the instrument to a high-concentration corrosive gas environment for a long time to prevent reducing sensor sensitivity or even damaging the sensor in severe cases.

6. Instrument Storage and Quality Assurance

6.1 Under non-human damage conditions, our company is responsible for a 12-month free warranty for this product. The warranty period starts from the date the user receives the instrument.

6.2 During use, users shall abide by the user manual. Damage to the instrument caused by improper use by users or operating environment exceeding the specified range is not covered by the warranty.

6.3 Our company shall not be responsible for the reliability of the instrument if the user opens and repairs it without permission or replaces parts in violation of the rules.

6.4 When storing in ships or particularly humid environments, please use a moisture-proof bag.

7. Product Completeness

7.1 One portable gas detector

7.2 One user manual

7.3 One product certificate/warranty card

7.4 One DC5V charger

7.5 One USB data cable



Nanjing Bahuan Electronics Co., Ltd.

Tel: +86-25-66772953

Website: www.bh17.cn

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