

Vape & Smoke Detector with CO Sensing

Technical Documentation

Usage · Configuration · Maintenance Guide

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1 Product Overview

This product is a LoRaWAN-based smoke alarm designed for indoor smoke monitoring. It is battery-powered and integrates a photoelectric smoke sensor that continuously monitors the environment. Once smoke is confirmed, the device sounds a high-decibel buzzer locally and lights the alarm LED, while simultaneously reporting the alarm event to the backend over the LoRaWAN network. During normal operation it periodically reports heartbeat data (smoke reading, battery voltage, etc.) at a configured interval so the backend can track device status.

The device supports parameter configuration and firmware upgrade (OTA) by connecting a mobile phone to its built-in WiFi configuration page—no disassembly or dedicated tools required.

Table 1 Basic Features

Item	Description
Detection Principle	Photoelectric smoke sensor, dual-channel (blue light / IR) sampling
Alarm Method	Local buzzer alarm + alarm LED steady on + LoRaWAN remote reporting
Wireless Communication	LoRaWAN protocol, multiple regional frequency bands available (see Section 5.4)
Heartbeat Reporting	One frame every 12 hours by default; configurable from 1 hour to 7 days
Configuration & Upgrade	Phone connects to device hotspot; configure parameters / upload firmware (OTA) via web page

2 Operating Principle and Logic

2.1 Low-Power Monitoring

The device normally stays in a low-power sleep state and wakes up approximately every 5 seconds to perform a quick check on the smoke sensor. If the quick check finds no anomaly, the device immediately returns to sleep, so no external indication is visible—this is normal. Once the quick check detects an abnormal smoke reading, the device immediately switches to continuous detection and uses a complete decision algorithm (magnitude of change, rate of rise, multiple consecutive confirmations) to determine, avoiding false alarms caused by dust, moisture, and similar interference.



2.2 Alarm Procedure

After smoke is confirmed by the algorithm, the device immediately drives the local buzzer to sound and lights the alarm LED, while sending the alarm event to the backend over LoRaWAN. The local buzzer and alarm LED keep prompting until the smoke clears.

2.3 Periodic Heartbeat and Battery Status

The device periodically reports one frame of heartbeat data at the configured upload interval (default 12 hours, configurable from 1 hour to 7 days). The data includes the smoke reading, battery voltage, etc. The backend judges battery status from the voltage value in the heartbeat frame and issues an early warning when the battery is low. After power-on (or restart), the device additionally sends a startup heartbeat frame so the backend can confirm the device is online.

2.4 Button Self-Test

Press the test button (the BOOT button on the side of the device) once to run a self-test: the buzzer sounds for about 8 seconds and the alarm LED stays on, simulating a real alarm; at the same time a status frame requiring acknowledgment is sent to the backend. It is recommended to press the self-test once after installation; if the backend receives this frame, it confirms that both the device and the wireless link are working normally.

2.5 Buzzer Loudness Notes

The device uses a piezoelectric buzzer. Due to individual component variations, the alarm sound level may differ slightly between units, which is normal and does not affect the alarm function. An alarm is deemed valid by its function: during self-test or alarm, the buzzer sounds continuously and the alarm LED lights up, and the backend receives the corresponding report—this indicates the audible alarm function is normal.

The device tone is uniformly set at the factory and cannot be increased via the configuration page. If an individual unit's sound is too low and affects on-site use, please contact after-sales service.

3 Indicators and Buttons

Table 2 Alarm LED Status Meaning

Status	Meaning
LEDLight	Normal monitoring state



Status	Meaning
Steady on	Smoke alarm active, or self-test in progress
Flashing at ~0.5 s intervals	Configuration page (WiFi config mode) active

Table 3 Button Functions

Button	Function
WiFi Button	Opens the WiFi configuration page (see Chapter 5); the alarm LED switches to flashing as an indication
Test Button (BOOT)	Triggers self-test (see Section 2.4); also effective when pressed during sleep

4 Installation and Activation Procedure

4.1 Pre-Deployment Configuration (Engineer Operation)

The device leaves the factory without a device identity (DevEUI) written. A one-time configuration by an engineer is required before deployment:

1. Power on and wait for the device to finish booting;
2. Press the WiFi button; connect the phone to the device hotspot and open the configuration page (see Chapter 5);
3. Log in with the engineer account and fill in the pre-configured DevEUI
4. Save the configuration and restart the device; it joins the network automatically;
5. Press the test button once for self-test; activation is complete once the backend receives the self-test frame.

4.2 Recommended Installation Location

It is recommended to install on the ceiling at the center of the monitored area, away from air vents, fans, exhaust outlets, and other places directly exposed to airflow, and away from kitchen stoves directly exposed to cooking oil fumes or steam. Specific installation requirements shall comply with local fire codes and the product installation instructions.

5 WiFi Configuration Page

5.1 How to Access

Press the WiFi button on the device once to activate the hotspot. After the phone



connects to the hotspot, enter 192.168.4.1 in the browser address bar to open the configuration page. The hotspot auto-closes after about 1 minute with no connection, or if the total duration exceeds 3 minutes; press the button again to reopen it.

Table 4 Hotspot Information

Item	Content
Hotspot Name	Factory name Smoke-XXXX (changes to AS5-LN9-XXXX after DevEUI is configured)
Hotspot Password	ATOM2026

5.2 Login Accounts

The configuration page provides two login accounts with different permissions:

Table 5 Login Accounts

Account	Password	Role
admin	ATOM2026	Engineer account, full permissions
user	admin	Standard account

5.3 Items Not Configurable by User

The following items cannot be modified by the user account; log in with the engineer admin account to change them:

1. LoRa band / Sub-band;
2. OTAA/ABP keys (DevEUI, AppKey, DevAddr, NwkSKey, AppSKey) — user can view but not modify;
3. Raw smoke detection threshold — not displayed on the user page.

5.4 Full List of Configurable Items

The following items can be configured by both accounts:

Table 6 Configurable Items Overview

Configuration Item	Description
OTAA/ABP switch	Select the LoRaWAN network access mode
Transmit Power	8 levels from 0 (max) to 7 (min)
ADR	Automatic data rate adjustment switch

Configuration Item	Description
ACK Uplink	Confirmed uplink switch
Upload Interval	1 hour to 7 days
Smoke Sensitivity	High / Medium / Low (3 levels)
Buzzer Switch	Alarm sound on / off
Debug Log Switch	Debug output on / off

5.5 Firmware Upgrade (OTA)

The configuration page has a built-in firmware upgrade function: select the .bin firmware file directly on the page to upload. A progress bar is shown during upload; after transfer completes the device restarts automatically and runs the new firmware. Keep the phone connected to the device during upload; do not lock the screen or move the phone.

5.6 Save Rules

Click Save after changes; parameters are stored in the device and retained through power loss. LoRa-related changes take effect after a restart—just restart the device after changing them on the page. Sensitivity level, buzzer switch, and debug log switch take effect immediately upon saving.

6 FAQ and Troubleshooting

Table 7 FAQ Troubleshooting

Symptom	Possible Cause	Resolution
Pressed the WiFi button but the hotspot is not found	Hotspot not yet activated or timed out and closed	Wait a few seconds and search again; if still none, press the WiFi button again
Connected to the hotspot but the page won't open	Phone not routing traffic through the hotspot, or a VPN is on	Turn off the VPN / "switch anytime anywhere" type toggle, then revisit 192.168.4.1 in the browser
LoRa parameters not effective after saving	LoRa changes require a restart to take effect	Restart the device (or close the configuration page and wait for automatic rejoin)
Firmware upload failed	Transfer interrupted (too far, screen locked)	Move closer to the device and retry; do not lock the screen during upload

Symptom	Possible Cause	Resolution
Backend not receiving data	Incorrect band / key configuration, or insufficient signal coverage	Verify the configuration parameters; press the test button for a self-test to validate the link; contact the platform provider
Device silent with no indication	Normal sleep monitoring, or battery depleted	Press the test button for self-test; if no response, contact after-sales service

7 Safety and Precautions

This product is an alarm notification device and cannot replace the standalone smoke detector required by fire regulations. In locations where fire codes mandate such devices, select the appropriate product per local regulations. Device alarm takes priority: when a smoke alarm is confirmed, the configuration page auto-closes and the buzzer sounds continuously until the smoke clears.

Do not disassemble the device or move internal parts by yourself; battery replacement and repair must be performed by qualified personnel. Periodically press the test button for self-test to confirm the buzzer and link are normal. Store the device in a dry environment free of strong corrosive gases; avoid water immersion and dampness.

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