V1.0.4

Aspirating Smoke Detector

Aspirating Smoke Detector

User's Manual

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【 User's Manual 】

Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

Operation Requirements

- Make sure that the power supply of the device works properly before use.
- Do not pull out the power cable of the device while it is powered on.
- Only use the device within the rated power range.
- Transport, use and store the device under allowed humidity and temperature conditions.
- Prevent liquids from splashing or dripping on the device. Make sure that there are no objects filled with liquid on top of the device to avoid liquids flowing into it.
- Do not disassemble the device.

Installation Requirements

 **WARNING**

- Connect the device to the adapter before power on.
- Strictly abide by local electrical safety standards, and make sure that the voltage in the area is steady and conforms to the power requirements of the device.
- Do not connect the device to more than one power supply. Otherwise, the device might become damaged.

- Observe all safety procedures and wear required protective equipment provided for your use while working at heights.
- Do not expose the device to direct sunlight or heat sources.
- Do not install the device in humid, dusty or smoky places.
- Install the device in a well-ventilated place, and do not block the ventilator of the device.
- Use the power adapter or case power supply provided by the device manufacturer.

CONTENT

1 Introduction

1.1 Overview

Aspirating Smoke Detector (hereinafter referred to as the device) is designed to monitor smoke in the early stage. Integrated with dual-wave length smoke identification technology, MEMS airflow sensing detection technology, and an intelligent environmental algorithm, this device analyzes sampled air in the laser detection chamber through the sampling pipe network distributed in the protected area. Once the surrounding smoke concentration reaches the alarm threshold, it will promptly send out a visual and audible alarm signal to remind the user to take immediate measures and simultaneously transmit the alarm signal to the fire alarm control panel through built-in relay.

The device can be widely used in rail transportation, data centers, warehousing and logistics, new energy storage stations, power systems, ancient cultural relics, high buildings, cold storage, comprehensive pipe corridors, tobacco factories and other public places.

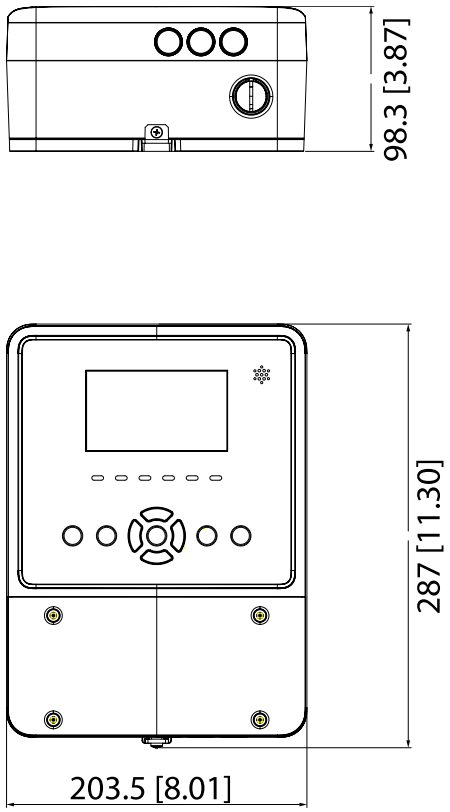
1.2 Product function

- Precise detection: advanced dual-wavelength laser particle identification technology greatly reduces false alarms caused by water vapor and dusts
- Smart self-study: dynamic self-study algorithm enables the device adapt to environment condition change
- Intelligent monitoring: advanced MEMS airflow sensing technology is capable of monitoring pipe damage and blockage
- Detection chamber self-cleaning: special structural design ensures a continuous flow of clean air through the laser detection chamber, achieving self-cleaning.
- Large monitoring area: Max. length of a sampling pipe is 79m, and the maximum monitoring area is 711m^2/1422 m^2
- Easy maintenance: intelligently monitoring filter life, and conveniently replacing the filter
- Strong protection: IP66 design suits for most application scenarios
- Diversified operation modes: supporting online management via RS485 connection to PC client
- Remote control: remotely reset through the fire alarm control panel to quickly address the alarm

2 Device Structure

2.1 Dimensions

Figure 2-1 Dimensions mm [inch]



2.2 Device Panel

Figure 2-2 Device panel

No.	Type	Function	Information
1	Display module	Display	4.3-inch color screen
2	Indicators	Fire	When the smoke concentration exceeds the threshold of fire alarm 1 or fire alarm 2 or fire alarm 3, the red fire indicator is constantly on. Once the fire alarm is triggered, the control panel will give a sound and light prompt, and the interface will record the first fire alarm. The fire indicator does not automatically turn off, which can only be turned off by resetting.
		Pre alarm	When the smoke concentration exceeds the threshold of pre alarm, action, fire alarm 1, fire alarm 2, and fire alarm 3, the red pre-alarm indicator is constantly on. Once the pre-alarm or action is triggered, the controller will give a sound and light prompt, and the interface will record the first alarm. The pre-alarm indicator does not automatically turn off, which can only be turned off by resetting.
		Fault	When the device works abnormally (such as sensor fault, pipeline blockage or damage, and abnormal filter lifetime), the yellow fault indicator is constantly on, and the buzzer beeps.
		Mute	Press **Mute** button, the yellow mute indicator flashes. If the buzzer beeps, press **Mute** button to stop beeping and mute indicator is constantly on.
		Power	Standby: Green indicator is constantly on.

No.	Type	Function	Information
3	Buttons	Test	Check whether the indicators, screen, and buzzer work normally. Press the **Test** button, all indicators are lit in sequence, and the screen flashes red, yellow, blue, and black in turn. After the test is completed, the screen resumes the main screen.
		Reset	When a fire alarm occurs, it can only be eliminated by manual reset. After the fault is resolved, the fault indicator will be automatically eliminated, and the fault note in main screen could only be eliminated by resetting. The device is still in normal working condition after resetting, and the device will enter alarm/fault status when alarm/fault is triggered again. Press **Reset** button and enter password to eliminate the fire alarm/fault status.
		Cancel	Press **Cancel** in any interface to close the notifications.
		Mute	The mute light is constantly off under normal circumstances. Press **Mute** button, the mute light will turn yellow and the buzzer stops beeping. After the silence duration, if the device is still in a fire alarm/ fault state, the buzzer beeps again, and the mute light will be normally off.
		OK	Press **OK** to confirm the operation.
		←	-
		→	
		↑	
		↓	
4	Buzzer	/	Send out alarm sound and fault sound.

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Alarm threshold: pre-alarm < action < alarm 1 < alarm 2 < alarm 3.

3 Technical Information

Specification	DHI -HY-ASD610B-P	DHI -HY-ASD620B-P
Operating Voltage	DC24V(DC18V~ DC30V)	
Maximum Current	2A	2A
Detection Sensitivity	0.001%-30% obs/m	
	Class A--Sensitivity pre alarm threshold 0.02% obs/m; alarm threshold 0.022% obs/m	
	Class B–Sensitivity pre alarm threshold 0.05% obs/m; alarm threshold 0.06% obs/m	
	Class C--Sensitivity pre alarm threshold 0.09% obs/m; alarm threshold 0.11% obs/m	
Alarm Levels	Pre-alarm, action, alarm 1, alarm 2, alarm 3	
Sampling Pipe	1×79 m	2×79 m
Max. Monitoring Area	711 m^2	1422 m^2
Sampling Tube Apertures	Inner diameter: 21 mm; outer diameter: 25 mm	
Max. Number of Sampling Holes	16	16
Relay	5 channels, 30VDC 5A	
Event Records	100,000	
Airflow Sensor	1	2
Communication Interfaces	RS-485, Ethernet	
Operating Temperature	-10°C to +55°C (14°F to +131°F)	
Operating Humidity	≤ 95% RH (non condensing)	
Storage Temperature	-40°C to +70°C (-40°F to +158°F)	
Alarm Method	Visual and audible alarm	
Material	PC	
Dimension (L x W x H)	287.0 mm x203.5 mmx98.3 mm (11.30″ x 8.01″ x 3.87″)	
Number of Outlet Holes	2	3
Installation	Wall mount	

4 Device Installation

4.1 Installation Principles

- Make sure the application scenario conforms to installation requirements.
- Ensure the proper external wiring.
- Make sure that the power supply of the device works properly before use.
- Do not attempt to open or disassemble the detector.
- The detector must be installed by a competent person.

WARNING

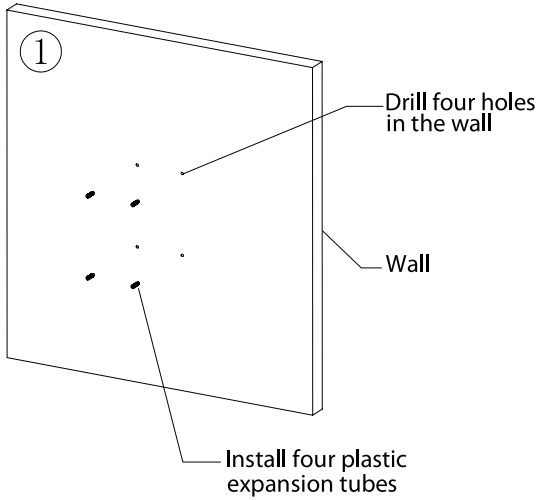
Before installation, be sure to cut off the power supply of the detector.

4.2 Installation Steps

Follow below steps to install the device properly.

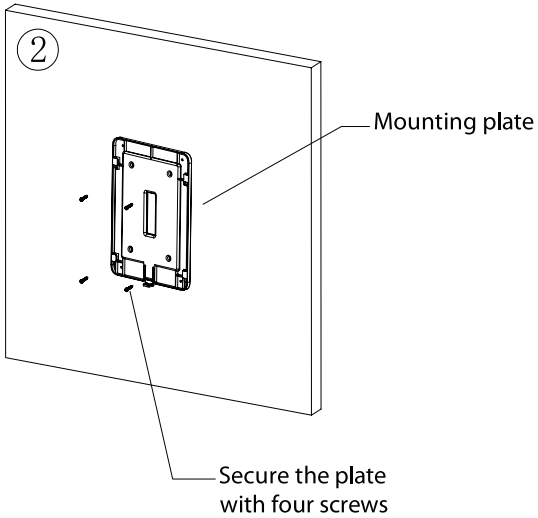
Step 1 Choose a suitable place .Drill holes (Φ8 mm [0.31"]) on the wall as the positioning map shows, and then align the screw holes on the wall with the expansion bolts..

Figure 4-1 installation (1)



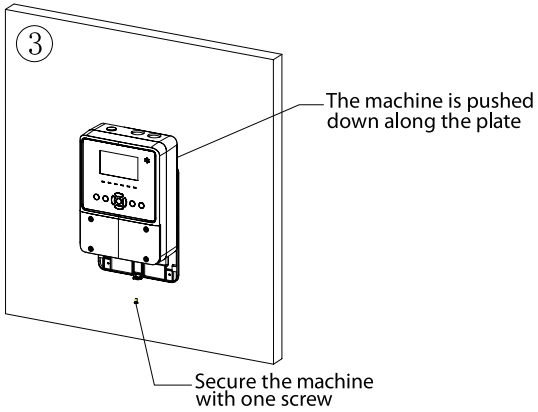
Step 2 Mounting plate and secure the plate with four screws.

Figure 4-2 installation (2)



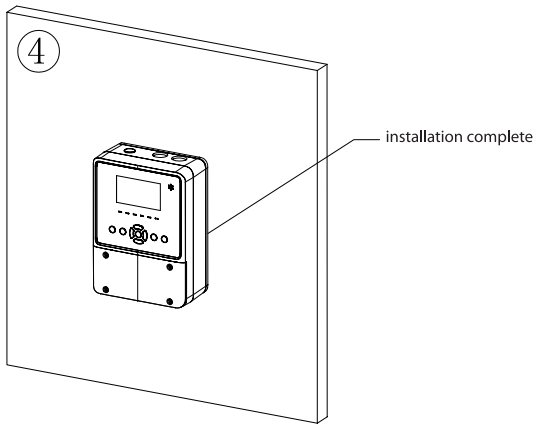
Step 3 Push the device down along the plate.

Figure 4-3 installation (3)



Step 4 Installation complete.

Figure 4-4 installation (4)



4.3 Wiring

Table 4-1 Terminal information

No.	Name	DHI-HY-ASD620B-P	DHI-HY-ASD610B-P
J14	COM1	1st relay COM terminal	
	NO1	1st relay NO terminal - normally open	
J15	COM2	2nd relay COM terminal	
	NO2	2nd relay NO terminal - normally open	
J16	COM3	3rd relay COM terminal	
	NO3	3rd relay NO terminal - normally open	
J18	COM4	4th relay COM terminal	
	NO4	4th relay NO terminal - normally open	
J17	COM5	5th relay COM terminal	
	NO5	5th relay NO terminal - normally open	
J5	DI1+	1st switch input positive end	
	DI1-	1st switch input negative end	
J13	CANL1/RS485_A1	1st RS-485 communication interface A	
	CANH1/RS485_B1	1st RS-485 communication interface B	
J20	RS485_A2	2nd RS-485 communication interface A	
	RS485_B2	2nd RS-485 communication interface B	
J1	24V_IN1+	1st DC24V positive end	
	24V_IN1-	1st DC24V negative end	
J2	24V_IN2+	2nd DC24V positive end	
	24V_IN2-	2nd DC24V negative end	
J4	/	USB interface for firmware upgrading	
J3	/	Program burning port	
J8	/	Ethernet connector	
J21	/	URAT	

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1. DI1+ and DI1- could be used to connect to FACP to realize remote reset. The device will reset when DI1+ and DI1- is connected.
2. RS485_A2 and RS485_B2 could be used to connected to PC client CRT.
3. J1 and J2 are both power in terminals, only one of them could be used in the same time.

4.4 Pipes Requirement

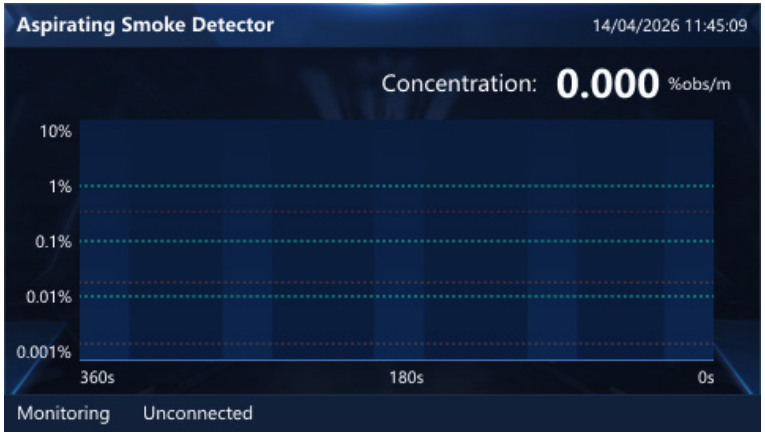
The sampling pipes and fittings shall have adequate mechanical strength and temperature resistance, refer to the standard EN 54-20 cl.5.7 for details.

5 Operation

5.1 Main screen

The main screen contains: smoke concentration curve, device status, alarm/fault notes and system time.

Figure 5-1 Main interface



5.1.1 Device Status

Located at the lower left of main screen, it contains operation mode and network status.

Type	Status
Opeation mode	Self-study: when the device is in self-study mode, it means the device is collecting smoke and airflow data base on the current environment and pipeline conditions. After the self-study process is finished, it will calibrate the baseline smoke and airflow values. There are two methods to enter self-study mode. One is when the device is powered on, it will carry out self-study automatically. The other is Fast Self-study from Device Management. Do not perform any operations to the device while it is in self-study mode. Monitoring: the device is in normal working status.
Network status	Unconnected: the device hasn't built connection with any platform. Connected: the device is connected to PC client or cloud platform.

5.1.2 Alarm/Fault Notes

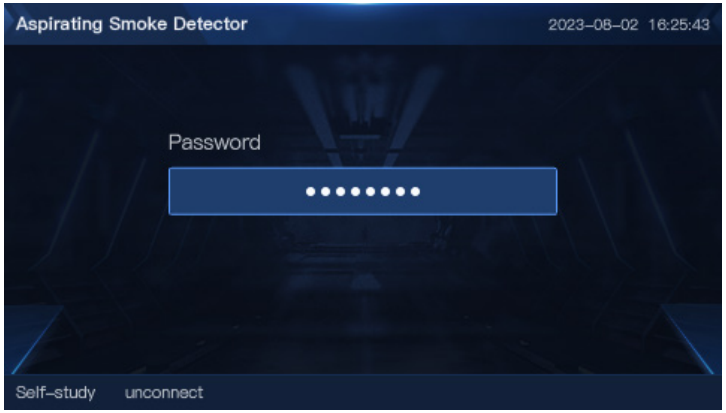
Located at the bottom and on the right of the 'Device Status'. The alarm/fault notes will be displayed when alarm/fault is triggered.

5.2 Operation

Press any button to enter the password, and then press **OK** to enter operation interface.

Level 1 password: ← ← → → ↑ ↓
Level 2 password: → → → → ↑ ↓
Level 3 password: ↑ ↓ ↑ ↓ → →

Figure 5-2 Enter the password



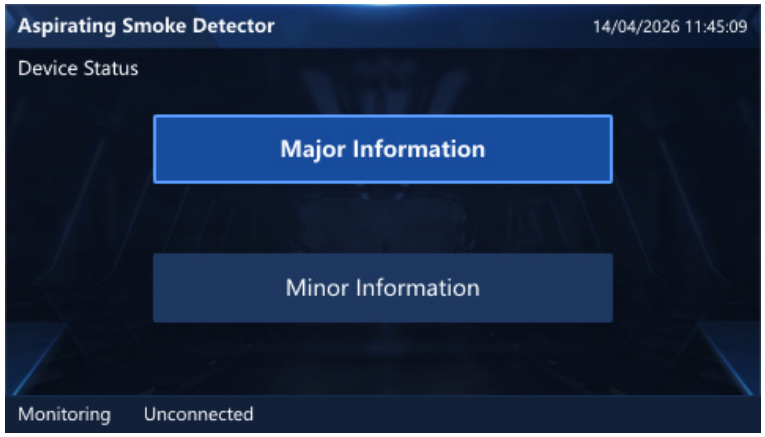
This interface consists of six parts: Device Status, Parameter Settings, Device Management, Communication Settings, Device info, and Logs.

Figure 5-3 Operation interface

5.2.1 Device Status

It displays parameters of host status and auxiliary sensor.

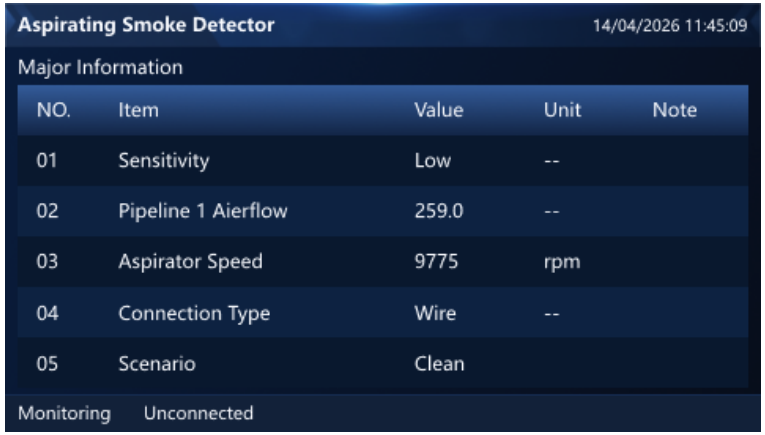
Figure 5-4 Device Status



5.2.1.1 Host Status

It consists of sensitivity, pipeline airflow, aspirator speed, connection type.

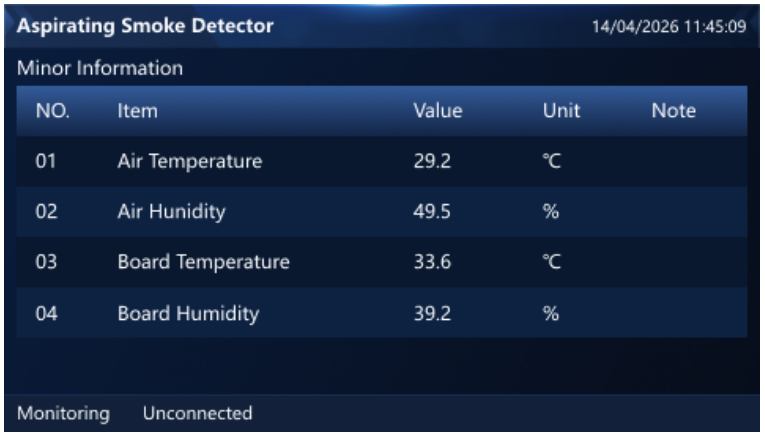
Figure 5-5 Host status



5.2.1.2 Auxiliary Sensor

It displays the temperature and humidity.

Figure 5-6 Auxiliary sensor



5.2.2 Parameter Settings

You can modify parameters by default to adapt to the on-site environment, including smoke detection parameter settings, relay settings, and auxiliary function settings.

To enter Settings, please enter the password level 2.

Figure 5-7 Settings

5.2.2.1 Smoke Detection Parameter

You can set sensitivity level, aspirator speed, self-study period, alarm delay, mute recovery period and alarm recovery period.

Press ↑ , ↓ to read more information.

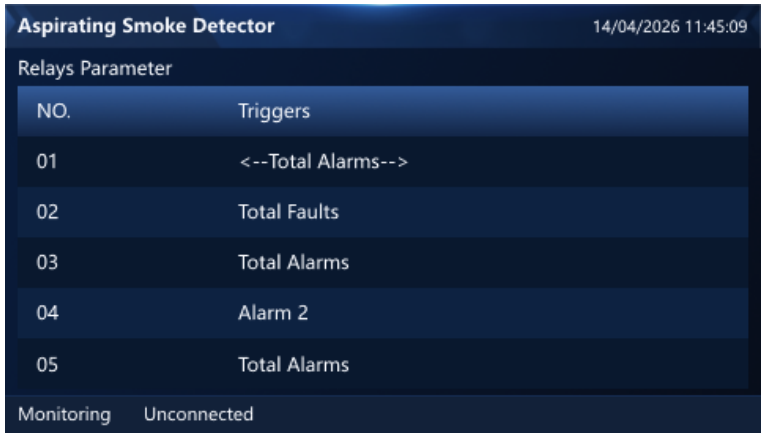
It is suggested to set the self-study period to 15 minutes or more after the equipment and pipeline installation and commissioning are completed, then power on again. The self-study period determines the time the device needs to perform self-study when it is powered on.

Figure 5-8 Smoke detection parameter setting

5.2.2.2 Relay

Equipped with 5 passive relays in this detector, you can freely connect them to input modules or sounder strobe.

Figure 5-9 Relay setting

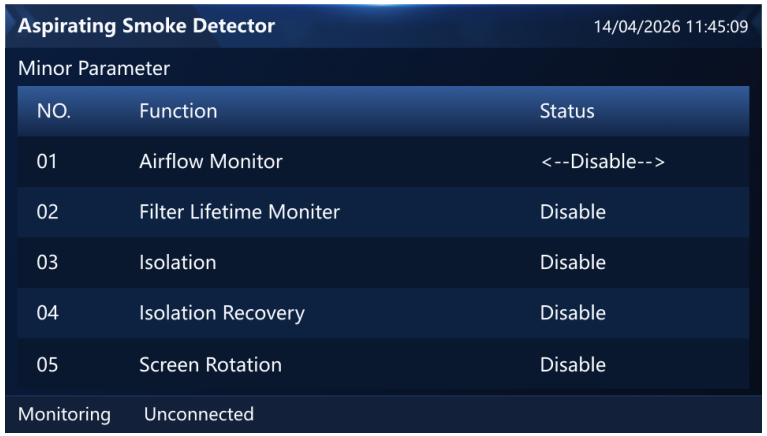


5.2.2.3 Auxiliary Function Settings

You can enable/disable airflow monitor, filter lifetime monitor, isolation, isolation recovery, and screen rotation.

- Airflow monitor
  Detect the change in flow speed of the suction pipeline to determine the pipeline blockage or damage.
- Filter lifetime monitor
  If the filter lifetime monitor function is enabled, when the dust holding capacity of the built-in filter reaches a certain level, the detector automatically sends out a fault notification.
- Isolation
  If the isolation function is enabled, the detector works normally without sending alarm and fault information to fire alarm controller. If you want to send information, please disable the isolation function.
- Isolation recovery
  If the isolation recovery period is set, the device will exit isolation mode after the set period.
- Screen rotation
  The screen rotation function is used when device is installed inverted in some special scenario. It permits to rotate the screen by 180°.

Figure 5-10 Auxiliary function setting



5.2.3 Device Management

This module consists of 8 parts: Software Update, Startup Image Update, Language Switch, Factory Defaults, Fast Self-study, Date & Time Modification, Date Format Setting and Debug Mode.

Press ↑ , ↓ to read more information.

To enter Settings, please enter the password level 2.

Figure 5-11 Device management

5.2.3.1 Software Update

The device supports upgrade software through the U disk. To upgrade, insert the U disk with the new program and click OK to confirm. Please do not operate the device during the update process.

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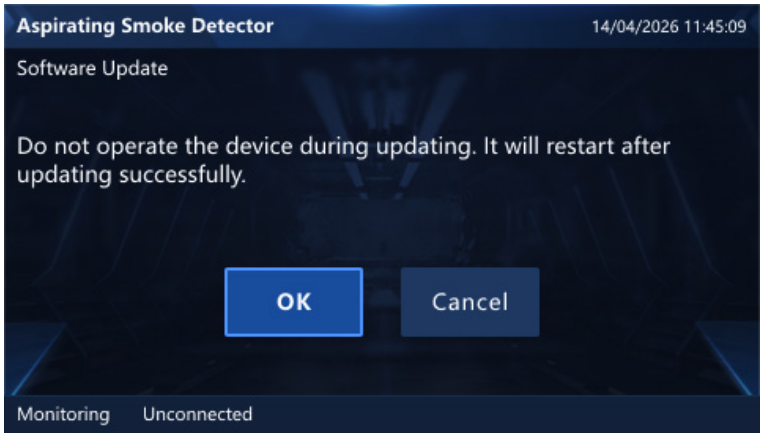
The format of U disk should be FAT32. The updating may be failed if it is in other formats. The upgrade file must be saved in the root directory of the U disk.

Figure 5-12 Software update



5.2.3.2 Startup Image Update

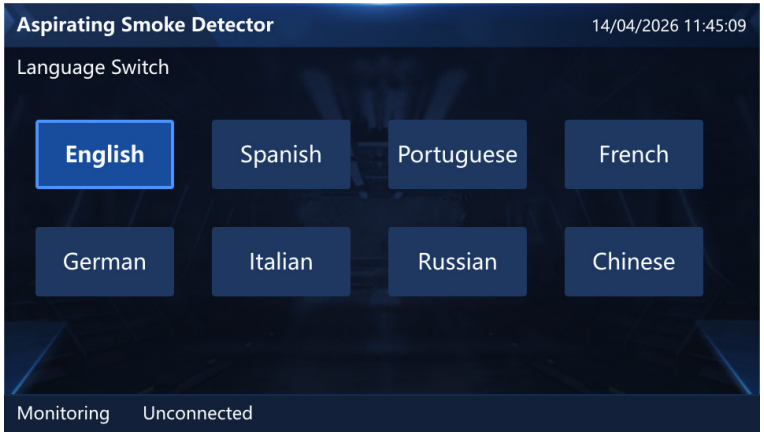
The device supports changing UI image through the U disk. To upgrade, insert the U disk with the new image and click OK to confirm. Image requirements: 480*272 pixels, in PNG file format.

Please do not operate the device during the update process.

5.2.3.3 Language Switch

Now 8 languages are available, including English, Spanish, Portuguese, French, German, Italian, Russian and Chinese.

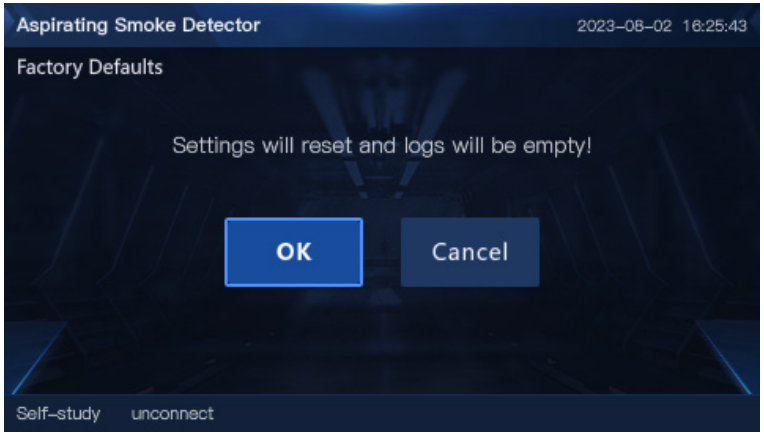
Figure 5-13 Language switch



5.2.3.4 Factory Defaults

Press **Factory Defaults** button and follow the instruction to reset device. Please do not operate the device during the reset process.

Figure 5-14 Factory defaults



5.2.3.5 Fast Self-study

The device offers a fast self-study function. Pressing fast self-study button will trigger a pop-up window; press "OK" to start self-study. The period of fast self-study is one minute. Do not perform any operations to the device while it is in self-study mode.

After modifying aspirator speed or pipeline condition changes, a fast self-study operation is necessary to allow the device to adapt to the new airflow changes; otherwise, airflow faults may occur.

5.2.3.6 Debug Mode

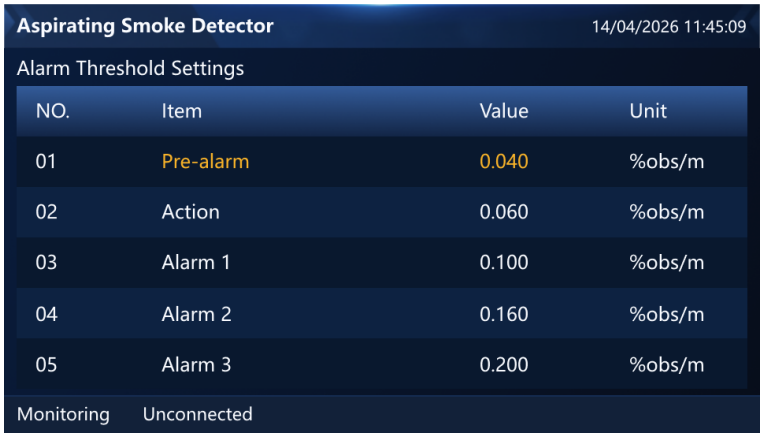
Users could enter Debug Mode to set fire alarm threshold, airflow fault threshold, and network parameters.

Figure 5-15 Debug mode

5.2.3.6.1 Alarm Threshold Settings

It supports setting all 5 alarm threshold values of high, medium, and low three sensitivity levels.

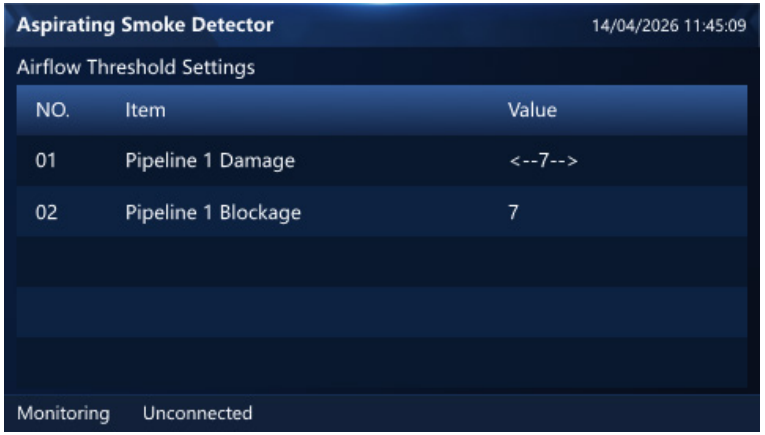
Figure 5-16 Alarm Threshold Settings



5.2.3.6.2 Airflow Threshold Settings

It supports setting pipeline damage and pipeline blockage threshold values for each pipeline.

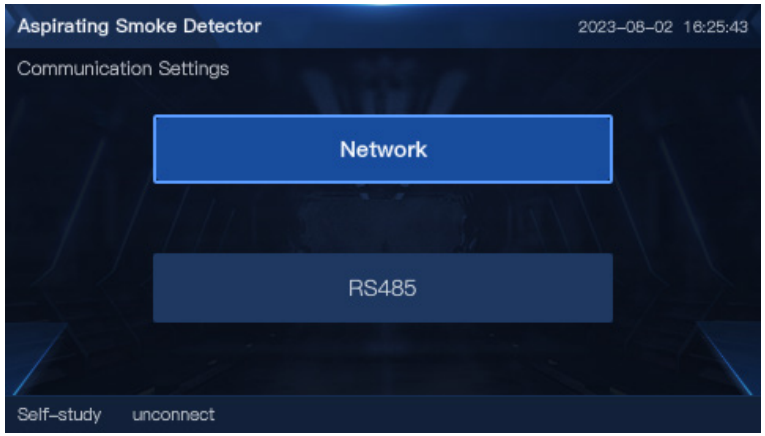
Figure 5-17 Airflow Threshold Settings



5.2.4 Communication Settings

Communication setting consists of network communication and RS-485 communication.

Figure 5-18 Communication setting



5.2.4.1 Network Setting

Network communication includes enable/disable DHCP, and display the network parameters. To set other network parameters, please enter Device Management -> Debug Mode -> Network Settings.

Figure 5-19 Network setting

5.2.4.2 RS-485 Setting

When devices are connected through RS-485, please configure RS-485 parameters, including device address and baud rate.

Figure 5-20 RS-485 setting

5.2.5 Device Information

It displays device model, SN, firmware version and hardware version.

Figure 5-21 Devcie information

5.2.6 Logs

It displays alarm logs, fault logs, and operation logs.

Figure 5-22 Logs

5.2.6.1 Alarm Logs

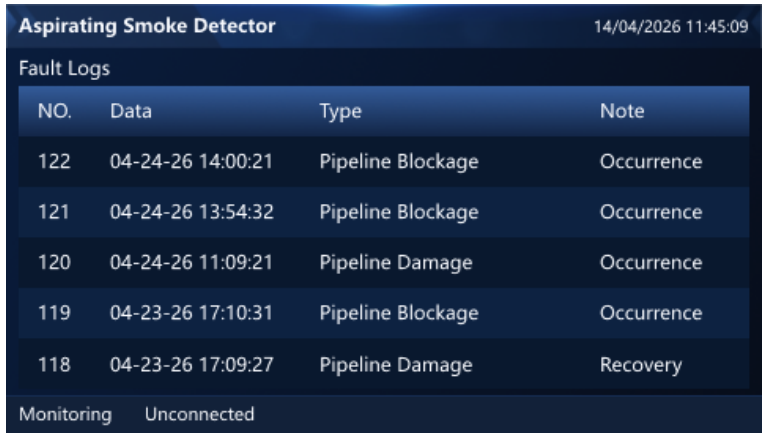
Alarm logs display detailed information of alarm records, such as the alarm time and smoke concentration of first alarm and reset.

Figure 5-23 Alarm logs

5.2.6.2 Fault Logs

Fault logs display detailed information of fault records, such as time, type, and status (occurrence, recovery).

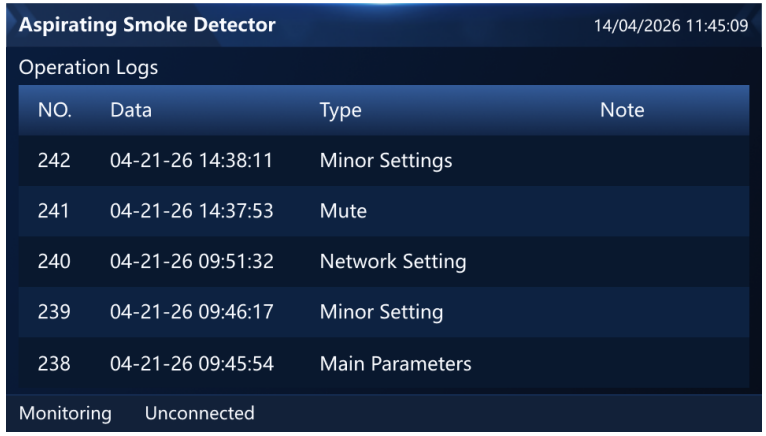
Figure 5-24 Fault logs



5.2.6.3 Operation Logs

Operation logs display detailed information of operation records, including quick operation (mute, reset, isolation) and parameter settings.

Figure 5-25 Operation logs



6 Frequently Asked Questions

6.1 FAQ

Problem	Analysis	Solutions
Your smoke alarm chirps intermittently	Aerosol interference sources or real fire hazards in the detected area	• Make sure that there is neither fire hazards nor aerosol interference • Adjust alarm sensitivity (high → medium → low) • If the problem still exists, please contact technical support for advice
	Frequently generated dust and vapor make the filter expired	• Install external filter and maintain regularly • Maintain built-in filter regularly
	Unsuitable environment	Do not place the device in a humid, extremely hot or cold site that has strong electromagnetic radiation or collision
Frequent airflow faults	Pipe blockage or damage	• Check the pipe • Confirm that there is no pipeline damage and pipeline blockage, then carry out Fast Self-study to adapt to the new airflow conditions
	Aspirator speed was modified or pipeline status changed, which made the airflow changed	
Filter lifetime failure	Filter life expired	Replace the built-in filter and reset the filter life (**Parameter Settings > Minor Parameter > Filter Lifetime Monitor**, Disable and then Enable again)
Other faults	Power fault or aspirtor fault	Please do not address the fault by yourself. Contact technical support after inquiring the fault code
No display after powering on	Poor contact	Check the wiring
	Power input is incorrect	• Make sure that the power supply is correct • Confirm that the 24V DC power cord has been inserted according to the terminal marking position, and the positive and negative wires have been correctly connected according to the terminal marking

6.2 On-site Handling Procedures

- If "Pre-alarm" or "Action" occurs in the device, the operator should immediately address the cause of the alarm and conduct an on-site inspection to eliminate fire hazards. Operator could leave the site only after confirming there is no fire risk.
- If "Alarm 1", "Alarm 2" or "Alarm 3" occurs in the device, the operator should immediately notify the fire supervisor and locate the fire source to control the fire. After the fire is eliminated, press the **Reset** button to disarm the alarm.
- To stop the alarm sound, please press the **Mute** button. To disarm the alarm, please press the Reset button. To disable the alarm/fault information from transmitting to platform and FACP, please enable the Isolation function.
- If the device is still in alarm status when the Reset button is pressed, it may cause by environment pollution due to fire. After cleaning the site, self-study should be carried out again.
- When the fault indicator is on, please check according to the fault information of the screen. If the fault cause cannot be located and recovered, please contact the technical support in time. Disassemble the device for maintenance without authorization is strictly prohibited.

6.3 Maintenance

To keep your device in good condition, please follow these requirements.

- Simulate alarm test: Test the device once a month (recommended).
  If the detector works abnormally, please contact manufacturer.
- Replace the filter
  During long-term use, the filter will be blocked due to accumulated dust. Therefore, replace the external filter or filter cartridge every 1 to 3 months when the environment is dirty, and replace the external filter or filter cartridge every 6 months when the environment is clean. Replace the built-in filter annually according to the filter life failure alert.

Step 1 Turn off the power.
Step 2 Open the front panel, remove the built-in filter, and replace it with a new built-in filter.
Step 3 Lock the front panel and power it on again.
Step 4 Enter the menu, **Parameter Settings > Minor Parameter > Filter Lifetime Monitor**, Disable and then Enable again.

6.4 Notice

During use, false alarms may occur due to some man-made or weather influences, please check in time.

This device is a precision electronic product and requires designated personnel for management. Unauthorized tampering is strictly prohibited. Users should carefully maintain duty logs. In case of an alarm, firstly press the "MUTE" button on the device, quickly confirm the fire situation, and then handle the situation accordingly. After that, record the operation log, and then press the "Reset" button to recover the device.