



RS-MG41-1

Composite multi-gas detector

User manual

Document version: V1.0



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1. Product introduction

1.1 product description

Potentially toxic or explosive gases may be used in the production process of many industries.

RS-MG41-1 is an intrinsically safe composite detector developed by our company for environments containing explosive or toxic gases. The instrument uses a natural diffusion method to detect the gas and an electrochemical combustion gas sensor. It has excellent sensitivity and excellent repeatability. The product can detect four gases: oxygen, flammable gas, carbon monoxide, and hydrogen sulfide. The product can store up to 130,000 pieces of test data, and the historical data can be viewed at any time with the software.

The product is easy to use and maintain, and meets the requirements of industrial site safety monitoring for high reliability of the equipment. The housing is made of high-strength engineering plastics and composite non-slip rubber, which has high strength and good feel, and is waterproof, dustproof and explosion-proof.

This detector is widely used in petroleum, chemical, environmental protection, metallurgy, refining and chemical, gas transmission and distribution, biochemical medicine, agriculture and other industries.

The design, manufacture and verification of this product comply with the following national standards:

GB3836.1- -2010 "Explosive environment Part 1: General requirements for equipment"

GB3836.4--2010 "Explosive environment Part 4: Equipment protected by intrinsically safe" i ""

GB15322.3- -2003 "Portable combustible gas detectors Part 3: Portable combustible gas detectors with a measuring range of (0-100)% LEL"

JJG693- -2011 "Verification Regulations for Combustible Gas Detection Alarm"

JJG 365--2008 Verification Regulations of Electrochemical Oxygen Analyzer

JJG695- 2003 Verification Regulations of Hydrogen Sulfide Gas Detector



1.2 Features

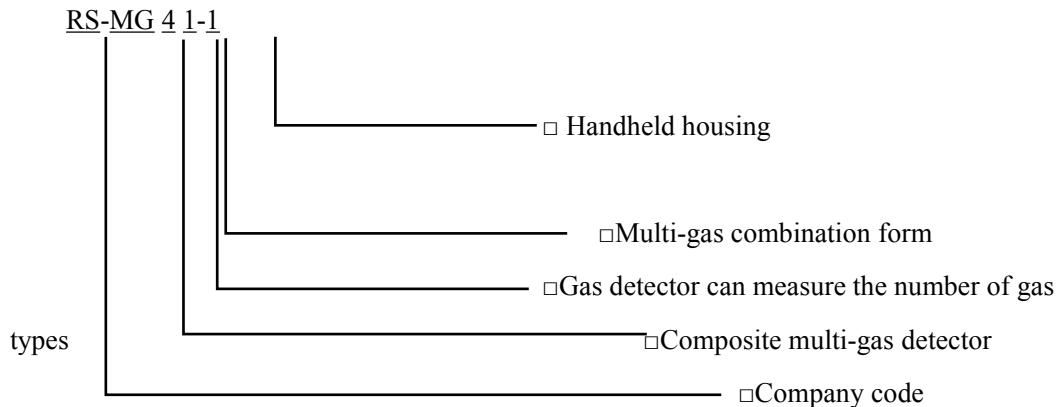
1. The product uses electrochemical and catalytic combustion sensors with excellent sensitivity and repeatability
2. The product shell has high strength and belongs to intrinsically safe explosion-proof products.
3. High-definition color screen design, easy to check the gas status
4. The product can detect four gases: oxygen, flammable gas, carbon monoxide and hydrogen sulfide
5. Can set high and low limit alarm value
6. Full-featured self-test, product adopts sound-light vibration three-level alarm
7. Shortcut key to quickly turn on and off audible alarm and storage mode
8. Up to 130,000 stored data, with the software to view historical data at any time
9. Large-capacity battery, the device can be used continuously for at least 8 hours in the constant light mode



1.3 Technical index

Detection gas	Carbon monoxide (CO)	Hydrogen sulfide (H2S)	Combustible gas (CH4)	oxygen (O2)
Detection range	0-1000 ppm	0-100ppm	0-100% LEL	0.0-30.0%VOL
Test content	70/300/700 ppm	20/50/80ppm	10%/40%/60% LEL	5.0%/15.0%/25.0% VOL
Indication error	Absolute error: ± 5ppm	± 5 ppm	± 5%FS	± 3%FS
	Relative error: ± 10%			
Duplicate value	≤2%	≤2%	≤2%	≤1%
Zero drift	±3ppm	±5ppm	±2%FS	±1%
Span drift	±5%	±5ppm	±3%FS	±1%
Alarm action value	50/150ppm	10/35ppm	20/50%LEL	19.5/23.5%VOL
Response time	Diffuse≤60S			
Insulation resistance	≥20MΩ			
Alarm function	Sound, light, vibration			
working environment:	Temperature -10 °C -50 °C; humidity <95% RH without condensation			
Operating Voltage:	DC3.7V (3000mAh lithium battery capacity)			
Explosion-proof mark:	Ex ib IIB T3 Gb			
Charging time:	6h-8h			
Standby time:	More than 8h continuous			

2.product model



3.Equipment List

One suitcase (contains tester equipment, USB plug, USB data cable, standard gas hood, certification, warranty card, factory inspection report)

RS-MG41-1 conventional gas detection range				
RS-MG41-1 conventional gas detection range	Range	Low alarm point	High alarm point	Resolution
EX	(0-100) %LEL	20%LEL	50%LEL	1%LEL
H2S	(0-100) ppm	10ppm	35ppm	1ppm
CO	(0-1000) ppm	50ppm	150ppm	1ppm
O2	(0-30) %vol	19.5%vol	23.5%vol	0.1%vol

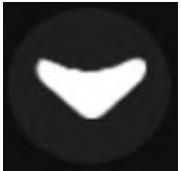
4.Way of carrying

Open the device with the surface buckle, snap the device to the place where you need to carry it, and then close the buckle



5.Function and operation instructions

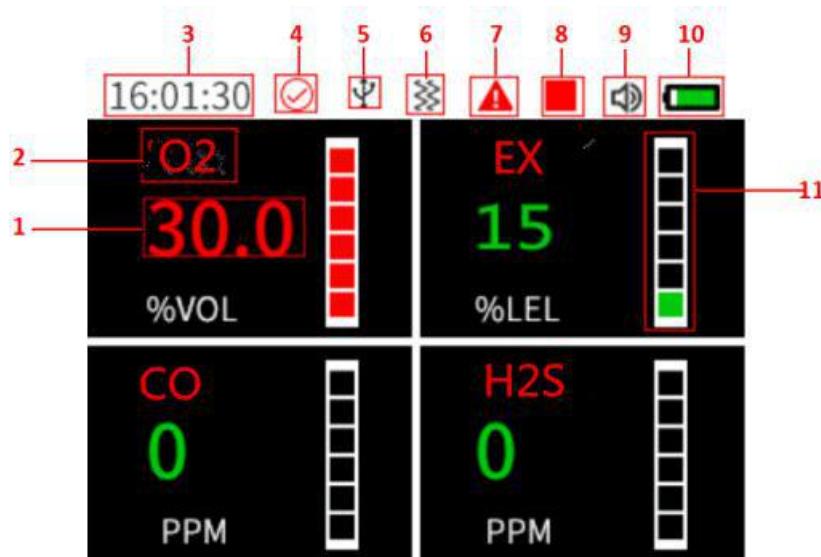
5.1Key Description

image	name	Explanation
	Increase build	Main interface: long press to turn on the buzzer alarm; Menu bar interface: short press, the cursor moves to the previous icon; Input value interface: short press to increase current value; long press to increase current value quickly.
	Decrease key	Main interface: long press to turn off the buzzer alarm; Menu bar interface: short press, the cursor moves to the next icon; Input value interface: short press to decrease current value; long press to decrease current value quickly.
	Cycle key	Password and time setting interface: the cursor moves to the next number; Menu interface: short press, the cursor moves to the next icon, Main interface: Long press to quickly turn on or off the function of storing data.



		Any interface: Long press to return to the main interface.
	Enter	<p>Power off state: long press 2S, the device enters power on state;</p> <p>Main interface status: long press 4S, the device is turned off, short press to enter the password interface</p> <p>Menu, input value interface: After the cursor confirms the option, short press to confirm the current option.</p>

5.2 Main interface introduction



Serial number	name	Description
1	Real-time value	Display the current actual gas concentration value
2	Gas name	Show gas name
3	time	Display the current time (manual adjustment)
4	Call the police	As shown in the figure, the total alarm sound, light, and vibration are turned on (the buzzer alarm can be turned off separately). When displayed, it indicates that the total alarm is turned off
5	USB socket	This symbol is displayed when the USB is inserted
6	shock	This symbol appears when the device is in a vibration
7	Alarm occurred	This symbol appears to indicate that the equipment inspection is in



		an alarm state
8	Storage status	The display ■ indicates that the device is in the state of stopping data storage. When it displays ▶, the device is in the state of storing data
9	buzzer	As shown in the figure, the buzzer is normally enabled and displayed when the buzzer is disabled:
10	Battery	When the alarm is off, the buzzer cannot be enabled
11	Proportion	Display the current remaining battery level

5.3 Instructions

1. In the shutdown state, press and hold the 2S confirmation key, the device detects whether the buzzer, flash, and vibration are used normally, and the device enters the main interface
2. On the main page, press cyclically to enter the password interface. The default password is 0000. Press the cycle to move the cursor to confirm, and click the confirm button to enter the menu interface. As shown in Figure 1:

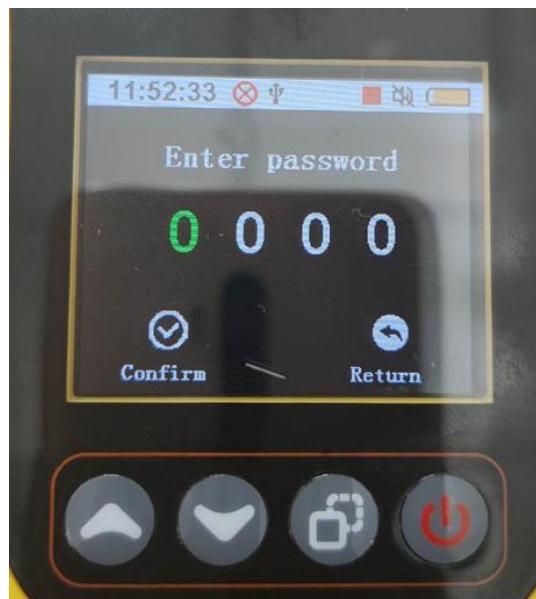
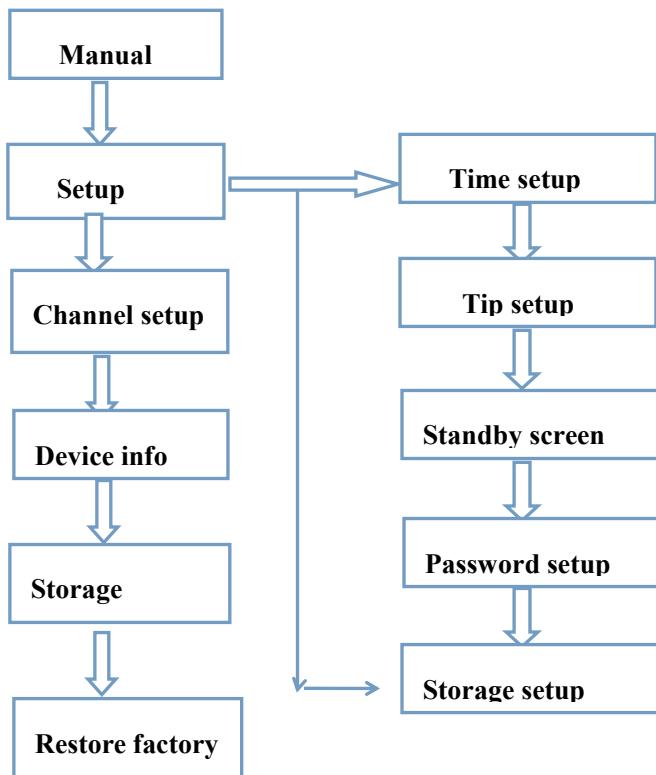


figure 1

5.3.1 System setup instructions

Move the cursor to the corresponding icon and click the confirmation key to enter the setting interface



Time setup: With increase button and reduce button to change the time, the cycle button moves the cursor to the next position. The cursor moves to the confirmation position at the end. Click the OK button.

Tip setup: Move the cursor to the corresponding option and click the confirmation to select it. Note: when the alarm is off. The sound can not be turn on. Turn off the alarm doesn't affect the low battery alarm function.

Standby screen: Select the corresponding time, click the OK button.

Password setup: With increase button and reduce button to confirm the present value, the cycle button moves the cursor to the next position. The cursor moves to the confirmation position at the end. Click the OK button. Click return button to cancel modify the password.

Storage setup: Start storage: start to save the data

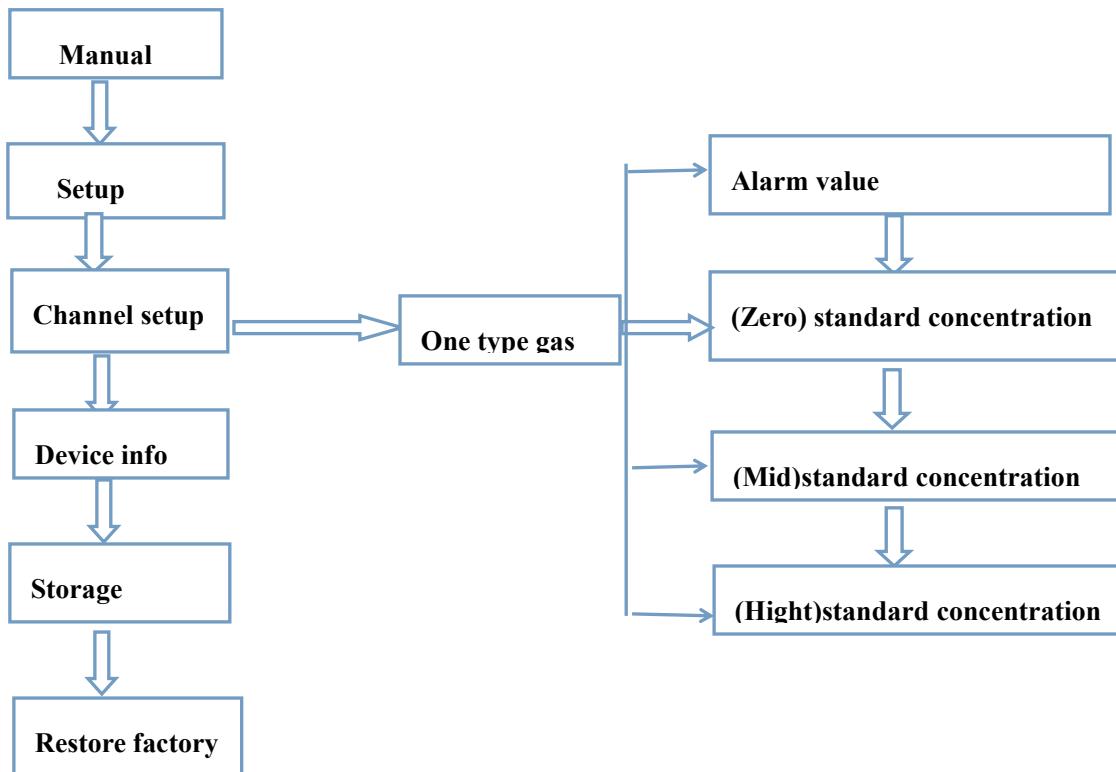
Stop storage: stop to save the present data

Delete storage: delete all the storage data

Storage interval: setup the save interval



5.3.2 Channel setting instructions



Alarm value: Via the increase button and reduce button to change the upper and lower limit.

Move the cursor to confirm button, click Confirm or Ok button. Alarm value setup finished.

O2: Measuring the concentration more or less than the limit value, the device will has alarm signal.

Other gas:Measuring the concentration more than the L Alarm value, it will has Alarm I.

Measuring the concentration more than H Alarm value, it will has Alarm II.

(Zero) standard concentration: Note:this operation must be operated in the clear air or N2. Enter in the operation screen, please move the cursor to Confirm or OK button. Return to the main screen, the gas reads 0(O2 reads 20.9).

(Mid)standard concentration: Note: Non-prefessional personnel are strictly prohibited to operate. This operation must be operated in the clear air or N2.

(High)standard concentration: Note: Non-prefessional personnel are strictly prohibited to operate. This operation must be operated in the clear air or N2.



5.3.3 Store data

Device View

Note: The storage settings need to be turned on in the system settings. The device cannot view the specific historical data. You need to use the configuration soft armor to read the data. Can be viewed in the device: gas type, current value, range, maximum value, minimum value, start storage time, end Storage time and number of storages.



5.3.4 Restore factory value

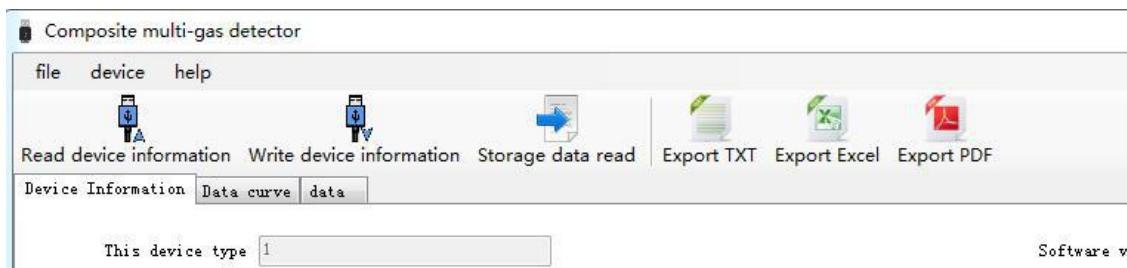


6. Configuration software instructions

After the software installation is complete, it will be generated on the

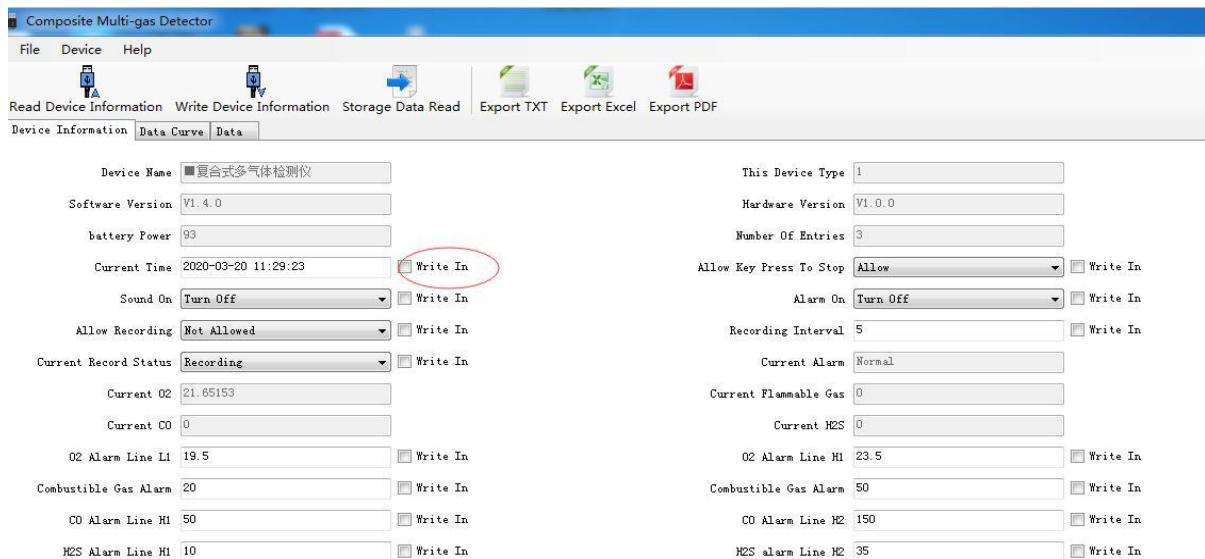
desktop “”Icon, double-click to open the software.

6.1 Set detection parameters



Connect the device to the computer through the USB data cable, click “Read Device Information” in the toolbar, and click “Write Device Information” after editing the device parameters to write the parameters to the device.

It should be noted that after the modified parameters are checked, modify the parameters, and then click Write Device Information, the parameter will be written to the device. This function is to facilitate the modification of other parameters by mistake when modifying individual parameters. Set.



Device name: Factory default, you can view it and cannot modify it.

Equipment type: Refers to the gas combination type of the detector.

Battery level: The remaining power of the detector.

Number of items stored: The number of records currently stored by the detector (total number of records for four gases).

Equipment time: You can check the clock time indicated by the tester to determine whether you need to adjust the time.

Allow button to stop reporting: If you select Allow, you can press and hold the decrease key to quickly turn off the alarm sound when an alarm occurs on the detector. If you do not allow it, you cannot turn off the alarm sound quickly.

Sound on: Set the alarm sound of the detector on or off.

Alarm on: Set the detector's sound, light and vibration alarms on or off.

Allow recording: Set the storage function of the detector on or off.

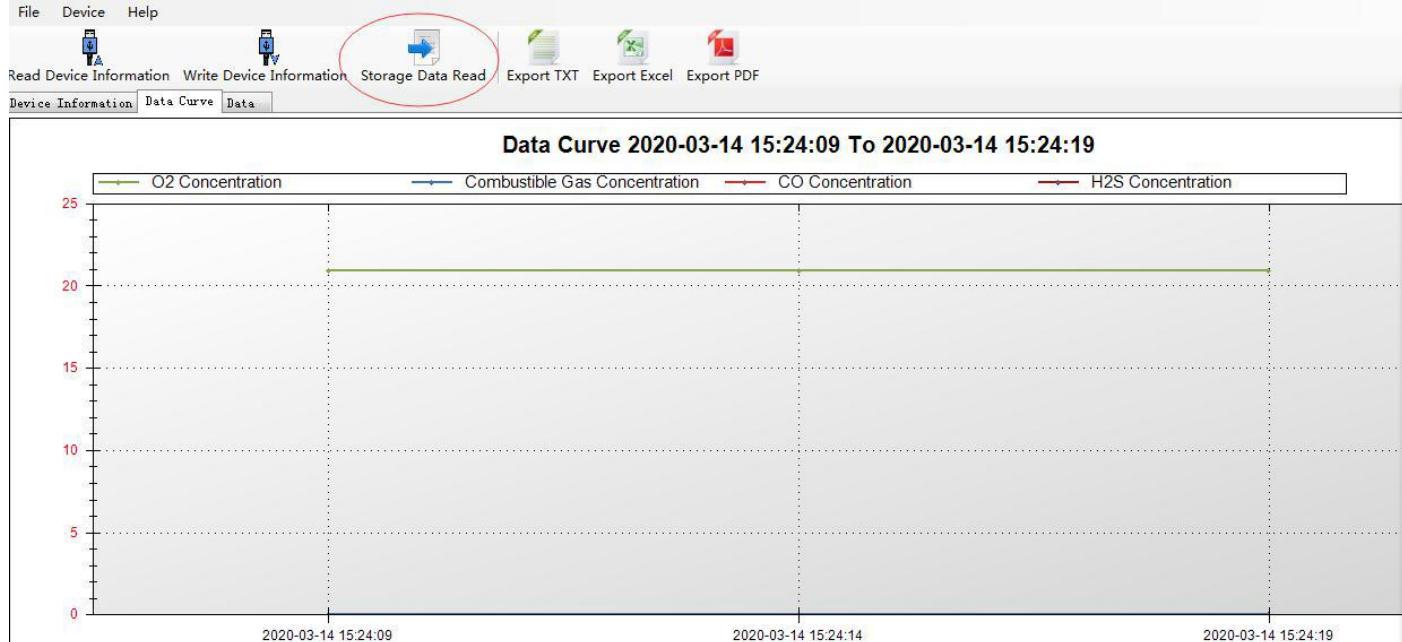
Recording interval: Set the recording interval time of the detector (default 5 seconds).

Upper limit of oxygen alarm, lower limit of oxygen alarm: Set the upper and lower oxygen alarm values.

Upper limit of flammable gas alarm and upper limit of flammable gas alarm: Set the low and high values of flammable gas alarm.

Upper limit of carbon monoxide alarm, upper limit of carbon monoxide alarm: set the low and high alarm values of carbon monoxide.

Upper limit of hydrogen sulfide alarm, upper limit of hydrogen sulfide alarm: Set low and high alarm values for hydrogen sulfide.



6.2 Import Data

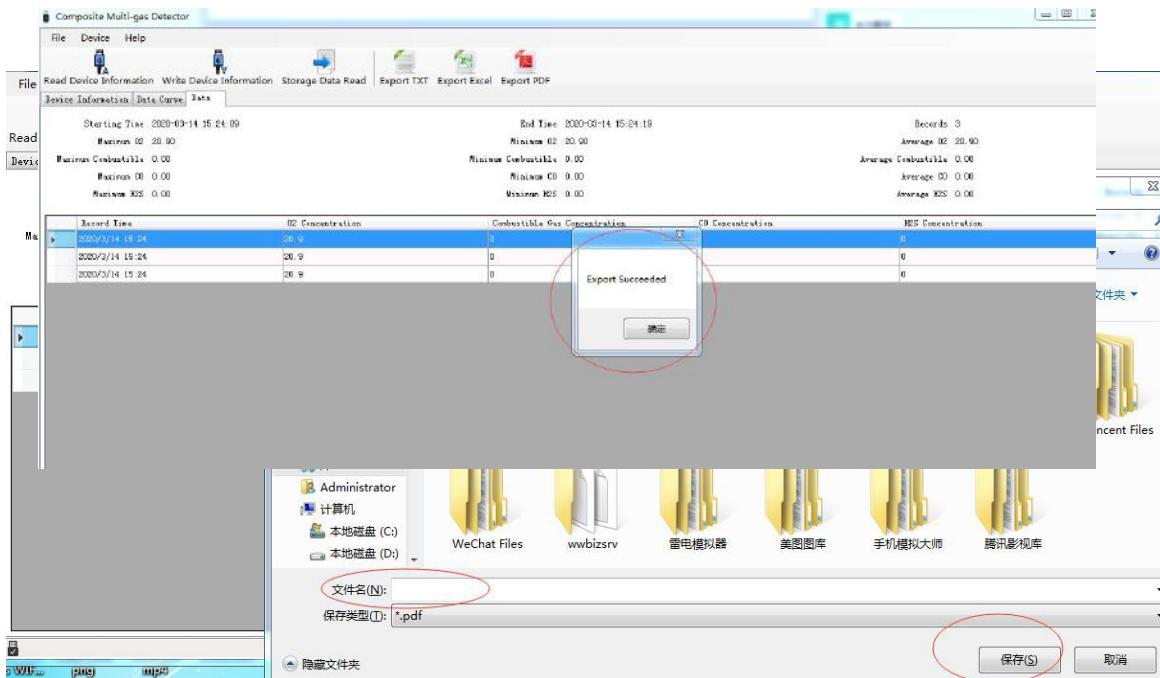
Open the multi-gas detector configuration software, and then connect the recorder to the computer via a USB cable. Click “Read Data” to import the data stored in the tester into the configuration software.

Click on the data to view the stored historical data in time.

Record Time	O2 Concentration	Combustible Gas Concentration	CO Concentration	H2S Concentration
2020/3/14 15:24:09	20.9	0	0	0
2020/3/14 15:24:14	20.9	0	0	0
2020/3/14 15:24:19	20.9	0	0	0

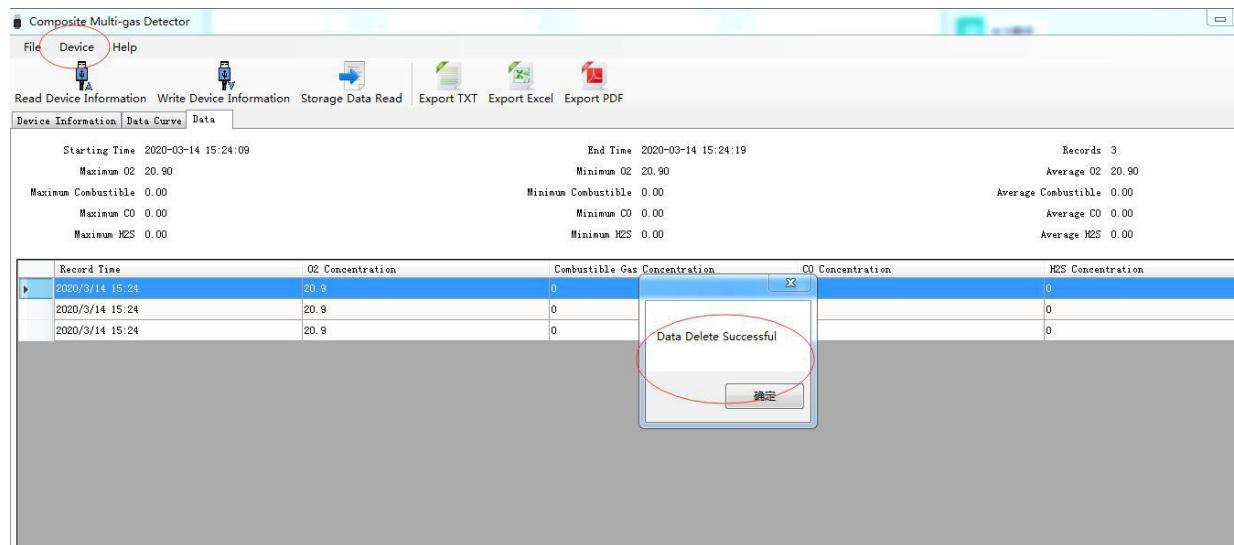
6.3 export data

Select the export format (TXT / XLS / PDF) on the toolbar to save the data to the specified path (take PDF as an example), and it prompts that the export is successful.



6.4 Clear device data

Click "Device" in the toolbar, and click "Delete device storage data" in the drop-down menu to clear the device data. After clearing, the software prompts "Delete cleared successfully".



7.Gas calibration

Due to the normal loss and aging of the sensor during use, the instrument needs to be calibrated after a long period of use.

To calibrate the equipment, a special calibration hood is required for calibration, as shown in



the figure below.:



* Please contact the manufacturer for specific calibration methods

8.Charging function description

When the power is less than 10%, the device issues an alarm (acoustic and visual vibration) every two minutes until the device is turned off.

When the device is off, connect the charger to the portable detector and the other end to the AC220V AC power supply. When the detector is fully charged, the battery capacity will be full and it can be used normally.

9.Precautions

1. Prevent the machine from falling from high places or receiving severe vibration
2. In high-concentration gas environment, the machine may not work properly
3. Please use the detector strictly in accordance with the instructions, otherwise it may cause inaccurate test results or damage the product
4. This product cannot be used or stored in the environment containing corrosive gas
5. If the device has not been used for a long time, please warm up and aging for 10 minutes before using it again.
6. To ensure the accuracy of the test, the machine should be calibrated regularly, and the test period should not exceed one year.
7. In an explosive gas environment, do not remove or replace the battery pack, and do not charge the battery pack.



10. Common faults and solutions

Failure phenomenon	Possible failure cause	Processing method
Can not boot	Voltage is too low	Please charge in time
	Crash	Contact your dealer or manufacturer for repairs
	circuit failure	Contact your dealer or manufacturer for repairs
No response from detection gas	circuit failure	Contact your dealer or manufacturer for repairs
Inaccurate display	Sensor expired	Contact your dealer or manufacturer
	Long uncalibrated	Replace the sensor
Time display error	Battery is completely drained	Please calibrate in time
	Strong electromagnetic interference	Replace the RTC battery and reset the time
Zero calibration function is not available	Excessive sensor drift	Reset time
Instrument normal detection interface	Sensor drift	Calibrate or replace sensors in a timely manner
Non-return to zero (except oxygen)	Sensor failure	Performing a zero calibration



11. Contact information

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Postcode: 250101

Phone: 400-085-5807

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Website: www.rkckth.com

Cloud platform address: www.0531yun.cn



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Document history

V1.0 document creation



Appendix Sensor Selection Table

Tested gas	Measuring range	Selectable range	Resolution	Alarm point
Combustible EX	0-100%lel	0-100%vol(Infrared)	1%lel/1%vol	low: 20high: 50
O2	0-30%vol	0-30%vol	0.1%vol	low: 19.5%high: 23.5%vol
H2S	0-100ppm	0-50/200/1000ppm	0.1ppm	low: 10 high: 20 ppm
Carbon monoxide CO	0- 1000ppm	0-500/2000/5000ppm	1ppm	low: 50 high: 150 ppm
CO2	0-5000ppm	0-1%/5%/10%vol (Infrared)	1ppm/0.1%vol	low: 1000 high 2000
Nitric oxide NO	0-250ppm	0-500/1000ppm	1ppm	low: 50 high: 150 ppm
NO2	0-20ppm	0-50/1000ppm	0.1ppm	Low: 5 High: 10 ppm
SO2	0-20ppm	0-50/1000ppm	0.1/1ppm	Low: 5 High: 10 ppm
CL2	0-20ppm	0-100/1000ppm	0.1ppm	Low: 5 High: 10 ppm
Hydrogen H2	0-1000ppm	0-5000ppm	1ppm	Low: 50 High: 150 ppm
Ammonia	0-100ppm	0-50/500/1000ppm	0.1/1ppm	Low: 20 High: 50 ppm
Phosphine PH3	0-20ppm	0-20/1000ppm	0.1ppm	Low: 5 High: 10 ppm
Hydrogen chloride HCl	0-20ppm	0-20/500/1000ppm	0.001/0.1ppm	Low: 5 High: 10 ppm
Chlorine dioxide CLO2	0-50ppm	0-10/100ppm	0.1ppm	Low: 5 High: 10 ppm
HCN	0-50ppm	0-100ppm	0.1/0.01ppm	Low: 10 High: 20 ppm
Ethylene oxide C2H4O	0-100ppm	0-100ppm	1/0.1ppm	Low: 20 High: 50 ppm
O3	0-10ppm	0-20/100ppm	0.1ppm	Low: 2 High: 5 ppm
Formaldehyde CH2O	0-20ppm	0-50/100ppm	1/0.1ppm	Low: 5 High: 10 ppm
Hydrogen fluoride HF	0-100ppm	0-1/10/50/100ppm	0.01/0.1ppm	Low: 2 High: 5 ppm
Xylene / toluene	0-20ppm	0-1/10/50/100ppm	0.01/0.1ppm	Low: 5 High: 10 ppm