

# Portable Gas Detector User's Guide

RK-4001

Ver1.0



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## 1.1 Product Introduction

RK-4001 series portable gas detector is designed with the latest digital integrated circuit technology and international gas sensing detection technology, and is a new intelligent gas detector. RK-4001 adopts large-scale full color LCD display to display readings in real time. In terms of probe, the probe is selected from a famous brand in the industry. Based on several years of experience in gas transmitter development, it uses mature and stable probe scheme with long life.

The detector uses the natural diffusion method to detect the gas, and uses the digital chip of international large factory to design the detection circuit, which can achieve very high sensitivity and excellent repeat ability. The shell is made of industrial special high-strength composite plastic, which has the functions of waterproof, dust-proof and explosion-proof.

The detector is widely used in petrochemical, environmental protection, metallurgy, mining, agriculture, experiment, mapping and other industries.

## 1.2 Function

- It can detect 1-4 kinds of gas at the same time, and the manufacturer can customize the type of gas to be detected according to the needs of customers.
- It has a variety of units, including ppm, mg / m<sup>3</sup>, vol%, LEL, ppb and many other units to switch freely.

- Rich man-machine interface and full-color interface based on the latest embedded ideas can query, record and display gas data in real time.
- Three kinds of gas concentration display modes, gas individual digital + instrument display, multi gas collective display and optional real-time curve display.
- Select data storage function, support up to 100000 data storage function, export data to computer through Excel, and print, edit, icon display function, etc.

### 1.3 Primary Parameters

<b>PARAMETERS</b>	<b>TECHNICAL SPECIFICATIONS</b>
<b>Measuring Range</b>	O2:0-30%VOL CO:0-1000PPM H2S:0-100PPM Combustible gas: 0-100LEL
<b>Resolution</b>	O2:0.1%VOL CO:0.1PPM H2S:0.1PPM Combustible gas:0.1LEL
<b>Default alarm point</b>	O2:20%VOL CO:50PPM H2S:10PPM Combustible gas:20LEL
<b>Displaying Error</b>	$\leq \pm 3\%F.S$
<b>Response Time</b>	$T_{90} < 30$ seconds

<b>Linearity</b>	$\leq \pm 2$
<b>Repeat-ability</b>	$\leq \pm 2$
<b>Recovery Time</b>	$\leq 30$ seconds
<b>Operating Temperature</b>	-20℃ -50℃
<b>Operating Humidity</b>	<95%RH No Condensation
<b>Power Supply</b>	3.6VDC ,2000mAh(Standard) Lithium Battery
<b>Display Mode</b>	2.2 inch LCD Screen
<b>Communication Port</b>	USB(Charging and Communication )
<b>Data Storage</b>	Standard 15000 pieces of data storage space
<b>Protection Level</b>	IP65
<b>Explosion-proof label</b>	Exia II CT6
<b>Charging Time</b>	$\leq 8$ H (Standard)
<b>Size</b>	125*65*45mm
<b>Weight</b>	200g

## 1.4 Product Structure

As shown in the figure below, the product is mainly composed of shell, display screen, alarm light, buzzer, probe, key, back clip,



## 第 2 章 Basic Usage of Product

### 2.1 Basic Buttons of Equipment

The portable gas detector itself has three buttons to operate, as shown in the figure below. The button on the left is the **power button**. Long press for three seconds and release to turn on or off.

According to the press time, the **middle key** and the **right key** have two functions respectively: when you press one short time, the **middle key** represents page turning left and the **right key** represents page turning right; when you press one second for a long time, the middle key represents cancel and the right key represents confirm.



## 2.2 Equipment Status Bar

After power on, the first screen displays the welcome interface. After three seconds, it will automatically jump to the first interface. The status bar is above the yellow line of our device interface, as shown in the figure below.



12:31 on the left side of the status bar is the current time, which is 12:31 minutes. There are three icons on the right. The first icon is the storage icon. After the storage function is turned on, the icon will appear. Every time the storage function is turned on, the icon will automatically turn green. When the storage space is insufficient, the icon will turn red.

The second icon on the right is the USB plug-in icon. When your device is connected to the computer via the USB cable, the icon will appear. The third icon is the battery icon, which is used to display the battery power. When the system is charging, the power icon will turn green, the power bar will cycle from head to tail, and when the power is insufficient, the icon will turn red.

## 2.3 Product Basic Display Interface

The basic interface of the equipment includes the following three types: multi in one display interface, single gas display interface and discount display interface (optional).

The first interface, as shown in the figure below, is a multi in one gas interface, under which real-time data of all gases can be displayed concisely. When the gas is in the preheating period after power on, the gas will display "--. - -". Please wait for the data to be displayed after the preheater is finished. The normal gas is displayed in white font. When a certain gas exceeds the alarm limit, the gas will turn into red font to prompt that the current gas exceeds the limit and give an alarm.



After briefly pressing the "page right / confirm" key on the multi in one gas interface, it will automatically jump to the single gas display interface. The single gas display interface will only display a certain gas, but the displayed data is more comprehensive.

As shown in the figure, the current gas concentration is displayed in large font in the center of the screen, and the red exclamation mark represents the alarm situation. When the gas exceeds the standard, the red exclamation mark will appear, and the gas will change from normal white font to red font. There is an instrument line at the bottom of the center of the screen. The larger the gas concentration is, the longer the instrument line is. The minimum and maximum concentrations for the measurement period are shown below.

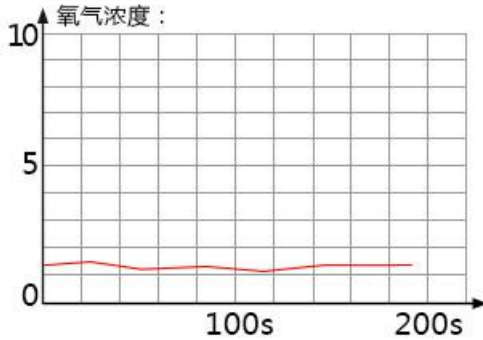




In the single gas display interface, a short press of "page left / cancel" key can realize the function of clearing the statistics of maximum and minimum values. At the same time, in the alarm state, the audible and visual alarm can be eliminated.

In the single gas display interface, briefly press the "page right / confirm" key to display the next gas. When all four gas interfaces are turned, it will automatically enter the broken line display interface (optional).

As shown in the figure, a coordinate system is formed on the screen. The horizontal axis is the time, and each grid is composed of two acquisition intervals. The vertical axis represents the gas concentration, and the red value is the real-time line chart of the data collected in the last 20 acquisition intervals.



## 2.4 Product Alarm and Alarm Elimination

When the concentration of the product is detected to exceed the alarm limit, the instrument will trigger the alarm state. At this time, the buzzer will sound "di di di", and the alarm light will flash regularly. The corresponding exceeding number on the screen will change from white to red, and the alarm icon will appear.



In the alarm state, a short press of "page left / cancel" key will eliminate the alarm and turn off the alarm state of buzzer and alarm light, but the red number and alarm icon

on the screen will not disappear. If another gas triggers the alarm again in the alarm elimination state, the buzzer and alarm light will still indicate the alarm until the alarm is removed or manually eliminated.

## 第 3 章 Product Function Setting

### 3.1 Basic Usage of Setup Menu

In any gas display interface, press the "turn left / cancel" button for a long time to enter the function menu. In the function menu, press the "turn left / cancel key" for a long time to push out the function menu to enter the gas display mode.



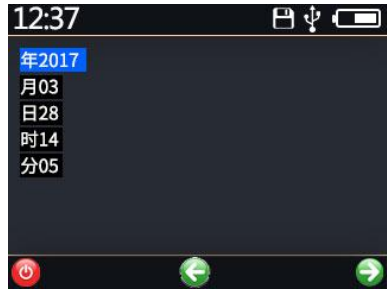
In the function menu, short press "page left / cancel" to page left or decrease the value, short press "page right / confirm" to page right or increase the value. Long press "page left / cancel" to cancel and return to the previous menu, long press "page right / confirm" to confirm and enter the next menu.

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In the main menu, you can choose to enter the next level submenu. The submenu is in the selection state in the red state. You can page up and down to select the menu you want to select. Long press the "page right / confirm key" on the parameter to enter the value editing state. At this time, the submenu is in the blue state. At this time, you can add and subtract values through the page up and down buttons.



Selection Status



Edit status

### 3.2 System Setup Menu

There are six settings in the system settings menu:



"Time setting": it is used to set the current time. Generally, it does not need to be set. It has been calibrated automatically.

"Automatic shutdown": it is used to set how long it will be automatically shut down without operating the equipment. The setting range is 0-15 minutes. The factory default setting is 0 minutes, that is, it will not automatically shut down.

"Backlight brightness": it is used to set the backlight brightness of the display screen. There are four brightness levels, of which 0 is the darkest and 3 is the brightest.

"Backlight sleep": it refers to setting how long it takes to turn off the LED screen without operation. The setting range is 0-15 minutes. The factory default setting is 0 minutes, that is, backlight sleep will not run.

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"Unit setting": it refers to the setting of four gas display units. According to the situation, you can select ppm, ppb,% vol,% LEL, mg / m<sup>3</sup> and other five conditions. Not every gas can select five units. Please refer to the equipment menu for specific available units.

"Local information": used to display the hardware version, software version, factory time, maintenance time, etc.

### 3.3 Alarm Setting Menu

There are five settings in the alarm setting menu, namely "sound and light alarm", alarm point 1 setting, alarm point 2 setting, alarm point 3 setting and alarm point 4 setting.



Among them, "sound and light alarm" is used to set

whether to turn on sound and light alarm, and the urgency degree of alarm sound after turning on sound and light alarm. Set 0 to turn off sound and light alarm. 1-5 represent different urgency procedures. The sound of 1 is the most compact, and the sound of 5 is relatively long.

The "alarm point setting" can set four kinds of gas alarm points. Some alarm points have been made by default. Please modify your own alarm points as needed. If you do not need alarm setting, you only need to set the alarm point to the maximum range.

### 3.4 Restore Factory Settings

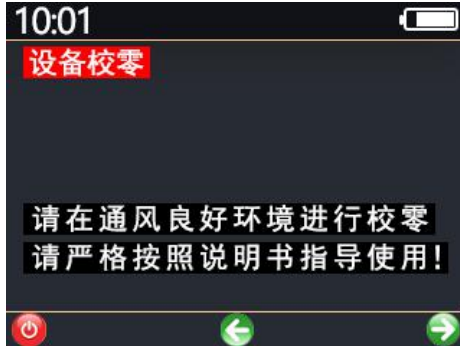
There are two options for restoring factory settings, among which setting and alarm restoring factory settings are basic restoration, and other configuration items except probe coefficient and probe zero point are restored to factory settings. Recovery of probe coefficient from factory settings is mainly to solve the problem of wrong probe recovery coefficient caused by wrong concentration calibration.

Neither of the above two recovery options will calibrate the probe zero point, so the probe zero point should be manually calibrated after the setup is restored.

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### 3.5 Zero Calibration Function

Long term use of probe or change of ambient temperature and humidity parameters will cause zero point change of probe. When zero point is not correct, equipment zero correction can be performed. In normal natural environment with good ventilation, zero calibration of equipment can be completed within about 1 minute after selecting equipment zero setting.



### 3.6 Data Recording Parameter Setting (Optional)

There are four items in the data recording menu, which are "automatic recording switch", "recording interval setting", "data usage", "recording data clearing".

"Automatic record switch": it can turn on or off the automatic record function. 0 is off and 1 is on.



"Record interval setting": you can set the record time interval. You can set the record time interval as short as 10 seconds and as long as 900 seconds.

"Data usage": it can tell customers how many pieces of data have been stored and how many pieces of data can be stored.

"Record data clearing": the data can be stored in different situations. Please note that the clearing process is irreversible, so please operate carefully.

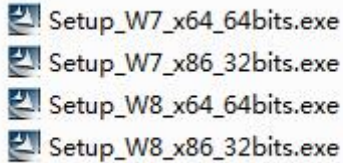
## 第 4 章 Record Data Export

### 4.1 Driver Installation

Before using our portable detector to connect with the computer, you need to install the driver. Please download the driver installation package from our official website. After decompressing, install different drivers according to your needs. Install "setup" on 32-bit systems of win7 and below\_ W7\_ x86\_ thirty-two bits.exe ” , 64 bit system installation "setup"\_ W7\_ x64\_ sixty-four bits.exe ” 。 Please install "setup" for win8 and above\_ W8\_ x64\_ sixty-four bits.exe ” (64 bit system) or please install "setup"\_ W8\_ x86\_ thirty-two bits.exe ” (32-bit

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system).



Setup\_W7\_x64\_64bits.exe  
Setup\_W7\_x86\_32bits.exe  
Setup\_W8\_x64\_64bits.exe  
Setup\_W8\_x86\_32bits.exe

## 4.2 Use of Data Software

First, connect the device and computer with the USB Mini data cable provided. After the USB plug-in icon appears in the device status bar, open the portable data reading software, select the correct serial port number, and click Connect device. After connecting the device successfully, click "read data" to read out all the data. In the case of large amount of data, it takes a certain amount of time to read, please wait patiently.



At the same time, the software can calibrate the equipment time with one click and clear the data with one click. When the equipment is connected, click the relevant button to calibrate the time with one click or clear the data with one click.

This software supports exporting data to excel table. Please confirm that you have installed Microsoft Excel tool (WPS is not supported), and then you can export data to excel table and store it locally. Note that the more data you have, the longer it takes to save. Please wait patiently.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	编号	时间	氨气浓度	氮气浓度	甲烷浓度	温度(℃)	湿度(88%)	杆塔										
2	1	2017-2-6 04:48	0	0	0	0	0	0										
3	2	2017-2-6 04:48	0	0	0	100	0	0										
4	3	2017-2-6 04:48	0	0	0	100	0	0										
5	4	2017-2-6 04:48	0	0	0	100	0	0										
6	5	2017-2-6 04:48	0	0	0	100	0	0										
7	6	2017-2-6 04:48	0	0	0	100	0	0										
8	7	2017-2-6 04:48	0	0	0	100	0	0										
9	8	2017-2-6 04:48	0	0	0	100	0	0										
10	9	2017-2-6 04:48	0	0	0	100	0	0										
11	10	2017-2-6 04:48	0	0	0	100	0	0										
12	11	2017-2-6 04:48	0	0	0	100	0	0										
13	12	2017-2-6 04:48	0	0	0	0	0	0										
14	13	2017-2-6 04:48	0	0	0	74.4	0	0										
15	14	2017-2-6 04:48	0	0	0	58.4	0	0										
16	15	2017-2-6 04:48	0	0	0	60.8	0	0										
17	16	2017-2-6 04:48	0	0	0	57.6	0	0										
18	17	2017-2-6 04:48	0	0	0	57.6	0	0										
19	18	2017-2-6 04:48	0	0	0	58.4	0	0										
20	19	2017-2-6 04:48	0	0	0	58.4	0	0										
21	20	2017-2-6 04:48	0	0	0	57.6	0	0										
22	21	2017-2-6 04:48	0	0	0	58.4	0	0										
23	22	2017-2-6 04:48	0	0	0	61.6	0	0										
24	23	2017-2-6 04:48	0	0	0	54.4	0	0										
25	24	2017-2-6 04:48	0	0	0	57.6	0	0										
26	25	2017-2-6 04:48	0	0	0	58.4	0	0										
27	26	2017-2-6 04:48	0	0	0	58.4	0	0										
28	27	2017-2-6 04:48	0	0	0	55.2	0	0										
29	28	2017-2-6 04:48	0	0	0	57.6	0	0										
30	29	2017-2-6 04:48	0	0	0	60.8	0	0										
31	30	2017-2-6 04:48	0	0	0	55.2	0	0										
32	31	2017-2-6 04:48	0	0	0	58.4	0	0										
33	32	2017-2-6 04:48	0	0	0	58.4	0	0										
34	33	2017-2-6 04:48	0	0	0	55.2	0	0										
35	34	2017-2-6 04:48	0	0	0	57.6	0	0										
36	35	2017-2-6 04:48	0	0	0	58.4	0	0										
37	36	2018-3-25 20:01	0	0	0	61.6	0	0										
38	37	2018-3-25 20:01	0	0	0	54.4	0	0										
39	38	2018-3-25 20:01	0	0	0	57.6	0	0										