



# User Manual

## JK9000 Series PAPERLESS DATA RECORDER

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## **One, overview**

JK9000 Touch Data Recorder has been widely used in all walks of life because of its abundant display screen, flexible operation mode and powerful recording, operation, control and management functions. This product absorbs the advantages of various data recorders at home and abroad. With the latest display technology, microelectronics technology, data storage and communication technology, it is a product with complete functions, convenient operation, accurate and reliable, and high cost performance.

This product is equipped with color LCD touch screen display. It can receive various types of current, voltage and resistance signals, and realize the functions of temperature, humidity, pressure, liquid level, flow, composition, force, torque, displacement and other physical quantities, such as display, recording, overstepping monitoring, report generation, data communication, signal transmission and flow accumulation.

This product is mainly composed of touch LCD screen, keys, ARM microprocessor as the core of the motherboard, main power supply, external power supply transmitter, data acquisition board, signal output board, large capacity FLASH, etc.

- \* Different types of intelligent data acquisition control boards can be equipped according to the application requirements.
- \* The built-in large capacity FLASH can quickly dump the data in FLASH to the computer through the U disk.
- \* Built-in FLASH capacity of 70M or more to 2G bytes, 8 channels if 10 seconds to record a time can record 720 hours, the fastest 1 second to record all channels of data.
- \* Digital display interface, bar graph display screen, real-time (historical) curve screen, alarm data page.
- \* The cursor function of historical curve reading.
- \* Basic error of measurement and display: + 0.2% FS.
- \* Multi point alarm function can be set up by parameter.

## **Two, functional characteristics**

This product displays a large amount of information, friendly interface and simple operation. The following are the main features:

- \*No pen and paper recording is needed, the daily maintenance workload is very small, and the operation cost is low.
- \*It adopts high brightness touch color, TFT LCD screen, CCFL backlight and clear picture.
- \*The ARM microprocessor can realize multi-channel signal acquisition, recording, displaying and alarming at the same time.(inside the instrument host, the maximum support for 64 channels and more channels)
- \*Using 70MB large capacity FLASH flash chip to store historical data, power failure will never lose data.
- \*Fully isolated universal input, can input a variety of signals at the same time, without replacing the module, directly on the instrument settings.

- \*The engineering data show a wider numerical range, which can display 6 digit values : -999, 99~1999.99;
- \*It can set parameter and display engineering location number, engineering unit. There are functions of flow accumulation and so on.
- \*It has red alarm display, indicating the lower and lower limits, upper and upper limits of each channel alarm; 8 relay alarm output (customized products);
- \*The display accuracy is high, and the basic error is + 0.2%F. S.
- \*Built in GB2312 Chinese character library, using full spelling input method;
- \*Supports external micro printing, built-in printer, manual printing of data, curves, automatic timing printing of data, to meet the needs of users on-site printing (customized products);
- \*Equipped with standard USB2.0 interface. The mouse and keyboard are easy to operate, and the output of historical data is fast and convenient.
- \*Standard serial communication interface, RS485 and RS232C with optical couple isolation and Ethernet (10.1 inch large screen type);
- \*Support standard ModBus RTU communication protocol (optional function), in addition to supporting the company's data management software, but also support other configuration software;
- \* Adopting the international brand switching power supply, it can work normally in the AC 85V~265V wide voltage range of AC power supply.
- \* Provide transmitter DC 24V isolation distribution;
- \* Through the EMCIII level, ensure the instrument works normally in bad environment.

## **Three, technical indicators**

### **3.1.display**

10.1 inch color TFT touch LCD digital display screen, bar picture, real-time (historical) curve screen, alarm display screen a total of four basic pictures. (8 channel contains comprehensive Interface)

The basic error is less than + 0.2%FS, the digital display range. -999.99~1999.99·

Measurement resolution: 1/120000, 24 bit AD converter

The real-time curve record interval is one second ~9999 seconds, corresponding to the whole screen curve time 30 seconds to 300 minutes.

The interval between historical curves can be set continuously from 1 second to 9999 seconds.

### **3.2 Input signal**

Input signals include DC current, DC voltage, thermal resistance, thermocouple, remote pressure gauge, through the button or touch screen input selection. Isolated universal input without jumper.

DC current: (4~20) mA, (0~10) mA, (0.01~20.00) mA;

DC voltage: 0.01mV~100V ;

Thermal resistance: Pt100

Thermocouple: K,J,E,T,R,S,B,N

Other input signals or indexing numbers should be specified when ordering.

JK9000 Analog input specification				
Item		Content		
Input type		Photoelectric relay scanning mode, full channel insulation input, balanced input		
Mode input terminal shape		M3 Screw terminal		
Measuring range	Voltage	0.01mV-100V F.S.(full range ) ,Highest resolution 1μV		
	Thermal resistance	Type : PT100		
	Thermocouple	Type : K、 J、 E、 T、 R、 S、 B、 N		
	Humidity	Digital signal input (Switzerland Rotronic accuracy 0.8%) (domestic high accuracy 1.5%)		
	Current	0.01mA-20.00mA		
	Sampling rate	100ms (full channel)		
Measuring accuracy	Temperature/ thermocouple	Types	Measuring temperature range (TS:measuring temperature )	Measuring accuracy
		R	0≤TS≤100℃	±5.2℃
			100<TS≤300℃	±3.0℃
			300<TS≤1600℃	±(0.05% of rdg.+2.0℃)
		S	0≤TS≤100℃	±5.2℃
			100<TS≤300℃	±3.0℃
			300<TS≤1760℃	±(0.05% of rdg.+2.0℃)
		B	400≤TS≤600℃	±3.5℃
			600<TS≤1820℃	±(0.05% of rdg.+2.0℃)
		K	- 200<TS≤0℃	±(0.05% of rdg.+2.0℃)
			0℃<TS≤1370℃	±(0.5% of rdg.+1.0℃)
		E	- 200≤TS≤-100℃	±( 0.05% of rdg.+2.0℃)
			- 100<TS≤800℃	±(0.05% of rdg.+1.0℃)
		T	- 200≤TS≤-100℃	±(0.5% of rdg.+1.5℃)
			- 100<TS≤400℃	±(0.1% of rdg.+0.5℃)
		J	- 200≤TS≤-100℃	±2.7℃
- 100<TS≤100℃	±1.7℃			
100<TS≤1100℃	±(0.05% of rdg.+1.0℃)			
N	- 200≤TS<0℃	±(0.1%of rdg.+2.0℃)		
	0≤TS≤1300℃	±(0.1% of rdg.+1.0℃)		
	Standard contact compensation accuracy		±0.5℃	
	PT100	- 100<TS≤100℃	±0.2 ( must be customized )	
A/D converter		Mode : ΔΣ , 16Bit(Effective resolution : ±1/40000)		
Maximum input	Between input terminal +/-	-100V~100V: p-p		

voltage	Between channel ( 1-1/ ( -1 )	60Vp-p
	Between input terminal/GND	60Vp-p
Maximum withstand voltage	Between channels	350Vp-p(within 1 minute)
	Between input terminal/GND	350Vp-p(within 1 minute)

### 3.3 Alarm output

Relay output: contact capacity AC220V, 3A, resistive load;

16 points can be set up by parameter, and can be set according to the alarm points in the channel.

### 3.4 External supply power supply

DC 24V power supply: used to supply the transmitter. Maximum load capacity  $\leq 200\text{mA}$ .

### 3.5 Communication printing interface (optional function)

Photoelectric isolation

Standard RS232 and RS485 communication; Ethernet communication standard should be specified when ordering.

The communication rate 96001920057600115200 is selected by setting.

Supporting test software, providing parameter setting software and application software technical support.

Optional Modbus RTU communication protocol and upper computer communication.

### 3.6 Power supply condition

AC 220V Instrument for power supply: AC 85~265V, Power consumption < 20VA;

DC 24V Instrument for power supply:  $24\text{V} \pm 10\%$ , Power consumption < 20VA.

Note: the actual power consumption is related to the total channel number of instrument.

### 3.7 Environment and others

Working temperature range :  $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$

Storage temperature range :  $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$

Working humidity range: below 85%R.H, Non Condensing

Instrument weight (64 channels): maximum 3.8Kg

### 3.8 Recording time

The length of Record time and FLASH Memory available capacity(Available capacity = total capacity - used capacity (internal procedure is generally 10M)), The recording interval is related to the number of input points. In order to facilitate the user to expand the channel in the future, so the number of recorded channels is uniformly set to 64 channels, the calculation formula is as follows:

$$\text{Record Number of days} = \frac{\text{Available memory } 70 * 1024 * 492 * \text{interrecord gap}}{\text{channel number } * 24 * 3600}$$

## Four, installation and wiring and shape structure

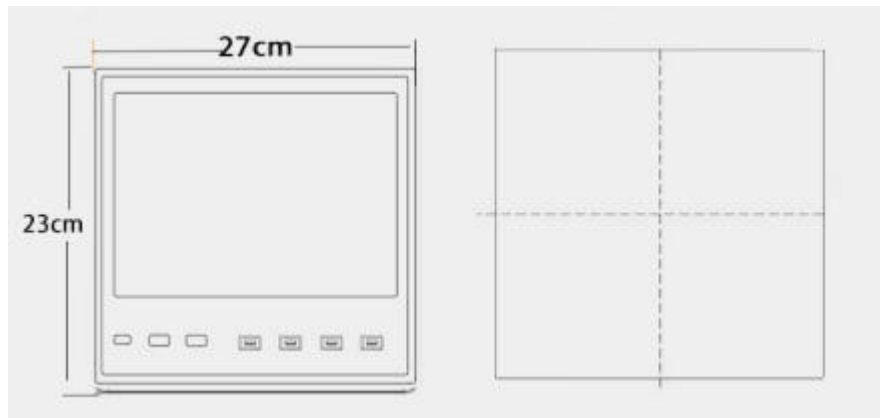
### 4.1 Shape and size of opening hole

To ensure safety, wiring must be carried out after power failure.

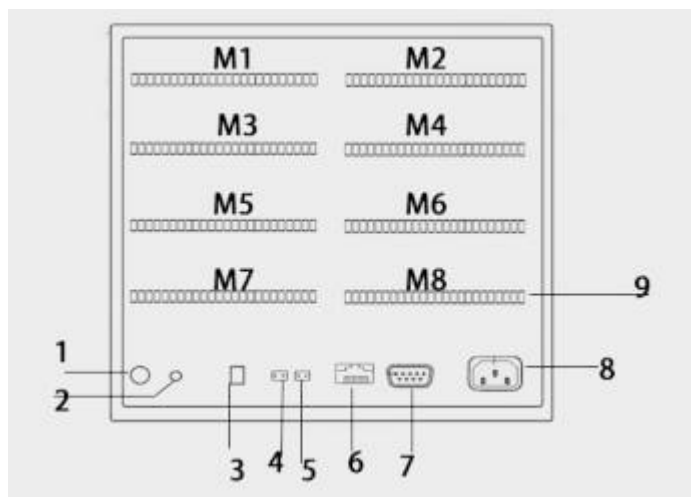
AC power supply instrument, its (PG) terminal is the common end of power filter, with high voltage, can only be connected to the earth, prohibited from connecting with other terminals of the instrument.

The basic wiring diagram given in this instruction is restricted by the number of terminals. When the instrument function is in conflict with the basic wiring diagram, the wiring diagram shall be based on random instructions.

Shape size: 270\*230\*180mm(length\*width\* depth)



### 4.2 Wiring terminal diagram



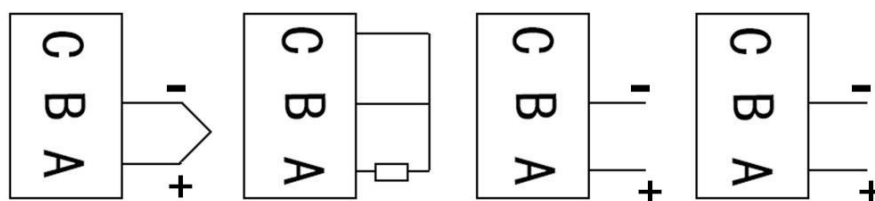
The module installation sequence starts from the upper left M1 (1~8 channel) to the right M2 (9~16 channel). Then go down the left M3 to the right M4 up the order up to the bottom left M7. The right is M8 (57~64 channel).

Relay signal output module is usually inserted into M8 position by default.

1. Wifi antenna
2. Sensor 18B20
3. DC24V Input port
4. DC24V Output port
5. DC 5V Output port
6. Ethernet interface
7. RS232 interface
8. 220V Power input terminal
9. Channel input terminal

The RS485 port is the input interface of the sensor or module connected with the RS485 signal, and the DC 24V is the output interface of the power supply for the external sensor. The connection of nine kinds of needles is: the second needle is the "RXD" (RS232), the third needle is the "TXD" (RS232) of the instrument, and the fifth needle is the "ground" of the instrument communication.

#### 4.3.1 Input signal wiring mode



Thermocouple  
signal access

Thermal resistance  
signal access

Voltage  
signal access

Current  
signal access

**4.3.2 Input signal wiring** (when the wiring module and acquisition module are assembled, do not disassemble, disassemble meeting leads to the damage of wiring module), the above wiring module is specific.



1-8 represents eight channels. A, B and C represent three terminals of a channel. ;  
Thermocouple signal input: A pin input signal positive, B pin signal input negative;  
Current signal input: A pin input signal positive, B pin input signal negative;  
Voltage signal input: A pin input signal positive, B pin input signal negative;  
Resistance signal input: resistors connect A, B feet, B and C are short.

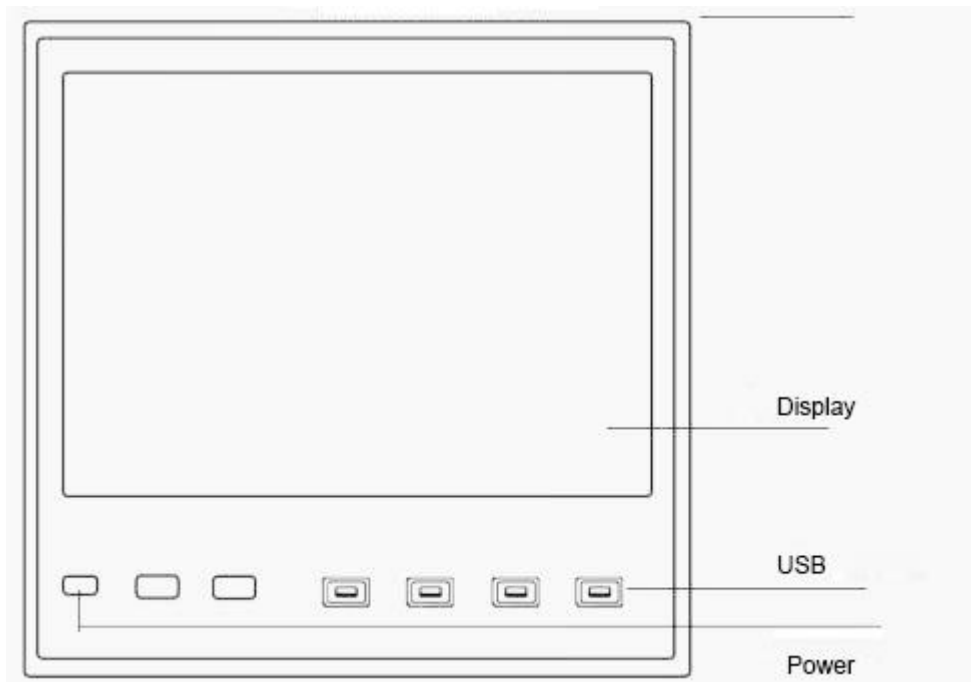
#### **4.3.3 Relay output signal wiring and installation instructions (optional)**

Relay output module JK1718, the machine is inserted into the M-8 right notch on the back right side of the instrument. When setting the upper or lower limit alarm of a channel, In the parameter settings window, Set the contact number corresponding to the upper and lower limit values. (Contact Number 1 corresponds to Relay Module Channel Number 1, Contact 8 corresponds to No8, Relay Switch Signal Output +-, Relay is normally open) . Example: The upper limit of the first channel is 50, and any relay contact of 1-8 can be set at the corresponding position. The upper or lower limit of the second channel can also be set at any contact of 1-8. After setting the contact points, when the value of this channel exceeds the upper or lower limit set, The relay on the upper or lower limit corresponding to the contact will work normally. It can also set the Return difference value. Return difference value refers to when the relay works. When the value of this channel goes back to the difference within the limit, the relay stops working. ( If the upper limit is 50, a channel value has exceeded 50, and the return difference is set to 2, At this point, the relay corresponding to the channel's contacts will work, and when the channel display value is less than 48, The contact relay corresponding to this channel will stop working at this time).

## **Five. Instrument operation and parameter setting**

The touch-type data recorder has a plurality of operation display screens and parameter setting interfaces, and has the advantages of clear display, large amount of information and convenient parameter setting. Users can operate instruments conveniently without professional training.

The shape of the 10 inch display is as follows.



When the instrument is connected to the power supply, it displays the boot interface of the system. After the boot system is completed, enter the real-time numerical display interface. The following are the keyboard operation of the instrument, each operation display screen, each parameter setting screen are introduced separately.

Click the settings button to enter the parameter settings screen. (No password is set after the new machine leaves the factory, and the entry is determined by the empty landing point). The parameter settings can be entered after the direct confirmation key.

### **System parameter setting**

System parameter setting is mainly used to set system date, system time, storage interval time, local IP address and other parameters, SMS alarm telephone number settings, described in the following 5.10.

### **Instrument parameter setting**

Channel parameter setting screen is used to set the signal type, station number, engineering unit, range upper and lower limits, filtering constants, flow parameters (small signal removal, square root), cumulative, alarm upper limit, alarm upper limit, alarm lower limit, alarm lower limit and so on.

The channel number and the unit of measurement are modified to click settings and enter the parameter settings to modify them.

### **Signal type**

The instrument supports a variety of signal types, in which analog signals support universal input, change the different signal types, as long as the terminal wiring and set the corresponding signal type here. When setting the signal type, be careful to match the signal of the instrument or the detecting element

### **Square sum and small signal removal**

The open square and small signal excision are used together, and the range of small signal removal can be set to 0~25.0%. Its function is that when the measurement value is small, the measurement error is large, especially below 1%, the accuracy will be greatly reduced, generally in engineering to zero treatment.

### **Transmitting Output**

There are three parameters about the output of the transmitter: the output channel, the upper limit of the output of the transmitter, the lower limit of the output of the transmitter, the output signal type has been set at the factory, These parameters are placed in the channel parameter setting screen, the output channel number range is 1 ~ 8, the use of additional instructions. About the operation function of the channel (virtual operation channel)

The channel of the recorder is divided into physical channel and virtual operation channel. The physical channel can not be set or changed after leaving the factory, but it can be increased. For example, the measurement value between physical channels can be obtained by simple operation, and the operation methods include addition, subtraction, multiplication and division. The channel participating in operation can only be physical channel.

### **5.1 Running Frame**

The screen displayed in the running process of the data recorder is the running screen, including the numerical display interface, bar chart interface, curve interface, alarm interface, and setting buttons, parameter settings, system settings, etc. Among them, the display interface, bar picture, real-time (historical) curve screen are commonly used basic pictures. The 8 channel's screen adds a comprehensive interface. The time in the upper right corner of the screen is displayed as the current date and time.

### **5.2 Opening interface**

The screen will display the click screen to enter the boot properties window, at this time we do not need to click the screen, let the screen directly into the boot screen display.

### **5.3 Display interface**

Display interface can have a more comprehensive understanding of the current situation, including channel name, measurement value, engineering unit, alarm indication, alarm output status, etc.

### **5.4 (digital display) digital display interface**

Digital display screen is divided into 64, 48, 40, 32, 24, 16, 8 channels digital display screen (8 channels have a comprehensive display screen), the user can enter the parameters set by the setting button to select the number of channels to achieve the desired number of channels to display the interface. The following is the 16 channel display interface.



The following picture shows the specific content of a single channel in the display screen, which contains the channel name, unit, measurement value and alarm sign four parts. The alarm signs are upper and upper alarm, upper limit alarm, lower limit alarm, lower and lower limit alarm from top to bottom. When the value is normal, the alarm sign is green. When the alarm value exceeds, the corresponding alarm sign will change from green to red. (Or, when the alarm occurs, the corresponding warning sign will turn from green to red.)

Display interface button function below:

There are six buttons at the bottom of the interface (save, display, bar chart, curve interface, alarm interface, settings).

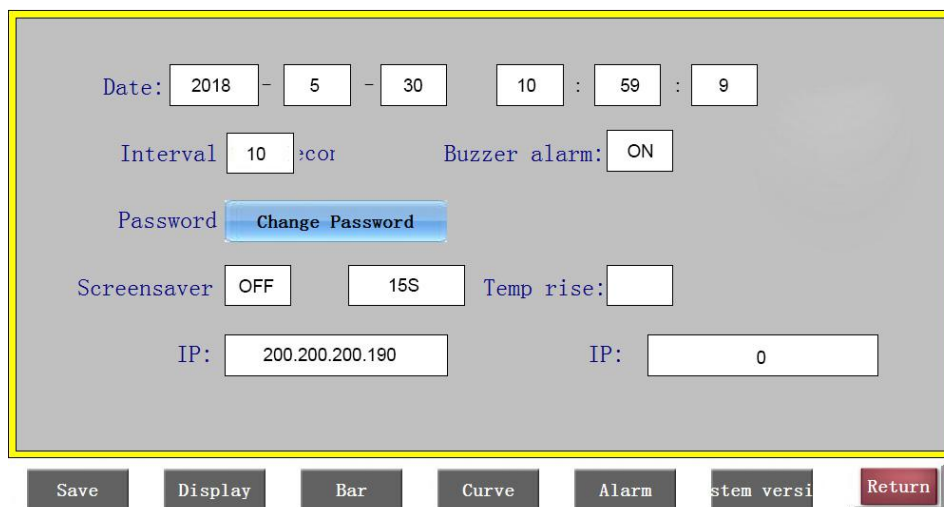
Save: When setting the parameters, the current set parameters for the initial set parameters and write them to disk, to prevent the parameters set in the parameters set when suddenly power off and lose the parameters set. (The current product has been updated with an instrumentation system that automatically saves parameters without using a save button)

Curve interface: Switch button, press this button can switch to the curve interface, which is divided into real-time and historical display screen.

Alarm interface: switch button, press this button can switch to the alarm interface, there is an alarm button below the alarm interface, press this button can enter to view historical alarm data, you can choose the time period to view historical alarm data.



the after-sales overhaul system version; there is also a brief instruction on the use of the instrument.



### 5.5 Comprehensive interface

The Comprehensive interface is only for the "8 channel display interface", and the interface is shown in the following figure. In the Comprehensive interface, the digital display interface, the real-time curve interface, the bar graph interface and the average bar graph display interface are integrated. Give customers a new experience of browsing the whole world.



The average bar graph shows the interface.

Average: the average of 8 channel data.

Maximum: the maximum value of 8 channel data.

Minimum: minimum value of 8 channel data.

### 5.6 (bar chart) bar graph display screen

Bar graph interface: toggle button, press this button to switch to bar graph interface. The bar chart screen is divided into four screens, which are "1-16 bar chart", "17-32 bar chart",

"33-48 bar chart", "49-64 bar chart". The page is switched by using the circular page turning mode. The picture below is 1-16 channel bar chart screen.



The above diagram shows the details of the bar chart interface channel, which contains the channel name, values and percentage bar chart display. The bar chart channel also has the alarm function. When the channel value is greater than the upper limit alarm value or less than the lower limit alarm value, the percentage filling color will turn red and the display unit is percentage. Bar graph interface button function and display screen interface is similar.

### 5.7 (curve) real time curve drawing

Current curve records only retain single-screen display data, according to the needs of observation, by changing the Y axis and the timescale X axis to change the display refresh speed, each curve is consistent, does not affect the FLASH record time interval.

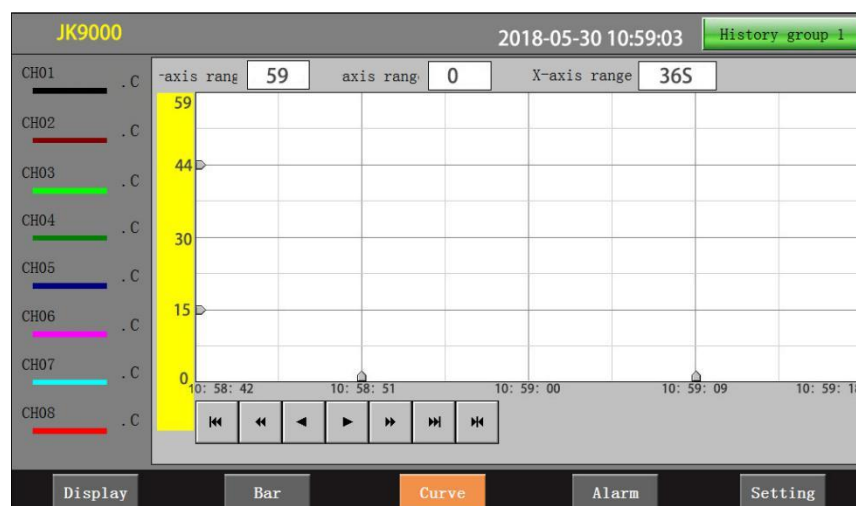


Under the real-time curve display the current channel measurement value, channel number, station number, engineering unit, curve interval, alarm status.

Range settings: Real-time curves have labels on the top of the screen that can set X and Y axis ranges, and the graph will change accordingly according to the range you set.  
 Real-time curve screen button function: the bottom button is similar to the display interface and bar chart interface, the upper right button is the switch button, through which it can see more channels of real-time curves and diachronic curves.

### 5.8 Historical curve picture

FLASH records are used for long-term data storage and are generally set at long intervals; records are selected from 1 second to 9999 seconds, with the same intervals for each channel. According to the needs of the production process, the reasonable setting of the interval of FLASH records, taking into account the contradiction between the interval and time, can accurately reflect the changes of process parameters. (Set the record interval, set the set button under the display interface to enter the system parameter test selection to set the record interval, described below)



The timescale in Recollection mode can not be changed, determined by the record interval of FLASH storage.

In the recollection mode, time is shown as the starting time of the right side of the curve.

The alarm status indicator in the recall mode is still a real-time alarm state, not a recording state.

The reading cursor mode is used to accurately display the values of each point in the Recollection curve. The value above the cursor is the actual value of the current channel at the cursor, and the time at the top right of the screen changes to the position of the cursor. In cursor mode, can not forward or backward recall .

The buttons in the picture shown from left to right are: Roll one page of the curve to the left of the X-axis, half page of the curve to the left of the X-axis, one main scratch position to the left of the X-axis, one main scratch position to the right of the X-axis, half page of the curve to the right of the X-axis, one page of the curve to the right of the X-axis, settings. The rest of the interface button functions are similar to the real time curve display screen.

Note:

1. If the recorder has been powered down, because there is no data record during the power failure, the curve will be discontinuous when recalling, and the historical data will not be lost.
2. If the recorder changes the recording interval during operation, there may be discontinuities or inaccurate historical data time when querying the historical curve.

## 5.9 Parameter setting interface

Channel parameter setting screen is used to set the signal type, station number, engineering unit, range upper and lower limits, filtering constants, flow parameter settings (small signal removal, square root), accumulation, alarm upper limit, alarm upper limit, alarm lower limit, alarm lower limit, relay output contact number selection and setting.

2018-5-30 10:48:15

Total Chnl: 8  
Channel: 1  
Type:   
Range: 0 100  
Sqrt:   
Filter:   
Coefficient: 3000  
Name: CH01  
Unit: °C  
Accumulate:   
Vacuum:   
Cut:   
LL: -10  
L: -10  
H: 50  
HH: 100  
Zone: 0  
Relay:   
Adjust:  $y=kx+b$  k= 1 b= 0

Save  
Copy  
Paste  
Bar  
Curve  
Alarm  
Display

language Clear data Export Sensor Set

Channel number: refers to the number of channels displayed in the display interface, such as 8, 16, 24, 32, 40, 48, 64, respectively, showing 8, 16, 24, 32, 40, 48, 64 channels in an interface, according to different needs to set different number of channels.

Channel: channel selection, select a channel, and then set the name, type, unit, and so on.

The range, the lower and lower limits, the lower limit, the upper limit, the upper limit and the adjustment are all the settings of the channel properties.

Contact: The channel number used to set the lower or upper limit of the alarm output to trigger the action of the relay module, as described in the 4.3.3 specification.

Name : name of channel

Type: type of channel.

Unit: unit of channel.

Range: the range of the channel. Setting the range is very important for bar graph display.

Upper upper limit, upper limit, lower limit and lower limit: four alarm values of the channel.

Adjustment: adjust the channel value to make it display the ideal value. By adjusting the K

value to adjust the temperature multiplier (multiplication and division), adjusting the b value can adjust the value of positive and negative values.

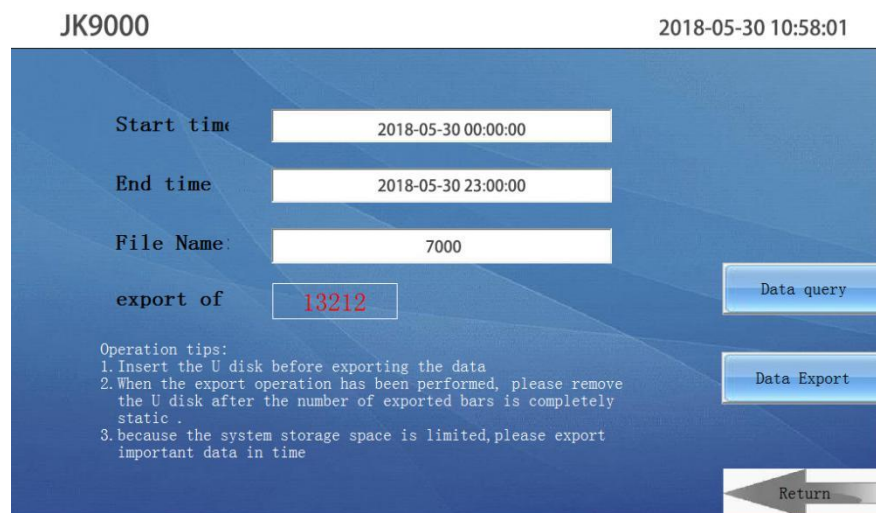
Button function

Clear accumulation: clear all saved data.

Replication: you can copy the parameters of a channel.

Paste: paste the paste to the current channel with the copied channel parameters.

Data Export: Switch button, by pressing this button into the "Data Export" interface (the U disk of the imported data is inserted into the USB port of the instrument).



In the data export button, there are two buttons: "quick export data" and "export data".

The difference between quickly exporting historical data and exporting historical data is:

One, quickly export data

Advantages: Fast speed, when the instrument data to tens of thousands, about 30 seconds time can be exported to all the data, in the rapid export of data is not supported when the selection of time period, that is, to export all the historical data in the instrument.

Disadvantage:

1. The instrument will stop data acquisition and storage during the period of data export, that is, all the other processes are in a dormant state except for the rapid export of historical data, and they will be awakened to execute when the data export is completed.
2. The exported data is stored in the U-disk data folder, and the generated data documents need to be opened and consulted by the company's PC-specific software.

Two. Data export

Advantage:

1. In the data export stage, the instrument can still perform data acquisition and storage functions, That is, other processes are still executing without hibernation, and you can set a selection period for data export.
2. The exported data is stored in the U-disk root directory and named in a time manner. It can be opened by an Excel table (if you want to use the Upper computer software to

access it, you can't change the file, otherwise the Upper computer software will not be able to recognize the file)

Disadvantage: Exporting data is slow, that is, exporting time is relatively long, if the data up to tens of thousands, exporting data may take more than 10 minutes or more. The above is the difference between the two, users need to operate according to their own needs.

Language: the language selection switch button can be displayed in Chinese and English.

### 5.10 System parameter setting interface

System parameter settings include: date, record interval, password settings, network interface communication IP settings, buzzer alarm, temperature rise, screen saver, device address. Date: set the date and time of the current system.

The screenshot shows a system parameter setting interface with the following fields and controls:

- Date: 2018 - 5 - 30 10 : 59 : 9
- Interval: 10
- Buzzer alarm: ON
- Password: Change Password
- Screensaver: OFF 15S
- Temp rise:
- IP: 200.200.200.190
- IP: 0

Buttons at the bottom: Save, Display, Bar, Curve, Alarm, stem versi, Return

Record interval: the interval between data storage. Setting the record interval has a direct impact on the density of the exported data.

Password settings: Click into the "User Manager" to modify the user password, add users, delete users and other operations.

Buzzer alarm: click switch and buzzer alarm function.

Screen saver settings: set the screen saver on and off, open state can set the time of the screen saver, after the set time the instrument screen will not light up, into the state of power saving.

Temperature Rise: This is used for measuring the temperature rise of power electrical switch contact devices. When the temperature rises, you can choose ON. The normal temperature is OFF. When ON is selected, the instrument subtracts the temperature of the first channel from the second channel to the last channel. The temperature of the other channels is one value higher than that of the first channel, where the temperature probe of the first channel is placed in the air.

Ethernet port communication function settings (IP settings only for 10-inch screen recorder, 7-inch screen to be customized):

10-inch screen recorder network port communication IP settings: Look at the router

specifications, different types of routers with different IP addresses, some 192.168.1.1, some 192.168.0.1; 192.168.1.1 for example: IP address settings: 192.168.1. \*, \* can be from 2 to 254, can not be set in the LAN used IP address. (This Ethernet communication function is only suitable for 10 inch display recorder.) The IP settings in the software should be consistent with those in the instrument, and the target port should be set to 3000.

### SMS alarm settings:

This function is set up for the instrument with custom SMS alarm function. It cooperates with GPRS SMS sending module to send SMS, just input the SMS phone number that needs to be received.


### 5.11 Alarm interface

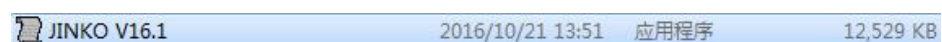
The alarm interface includes two parts: browse form and scroll bar to display alarm information. Browse forms can query alarm data at any time, and scrollbars display only the current alarm information. By browsing the "Settings" button in the lower right corner of the table, you can enter the "Settings Time Range" window and set its time to query the alarm information.

No.	Start time	End time	Alarm information
Data_H_14	2018-05-30 10:44:21	2018-05-30 10:44:21	CH14 above upper limit
Data_H_13	2018-05-30 10:44:21	2018-05-30 10:44:21	CH13 above upper limit
Data_H_11	2018-05-30 10:44:21	2018-05-30 10:44:21	CH11 above upper limit

## Six, Communication software instructions

### 6.1 System login

1. Find  JINKO V16.1 in -1020-2, double click then operate the system.



6-1 JINKO V16.1 Application Icon

2. Double click, then it will pop up main system of interface. Shown as 7-2.

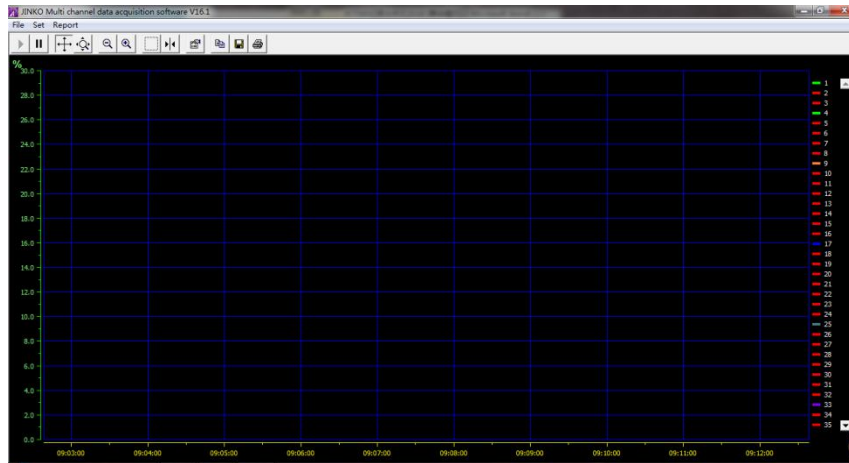


Figure 6-2 JINKO V16.1 main window

## 7.2 System interface introduction

1. Display area of system name: show in top left corner

2. Main menu: Contains 3 options "File(F)", "Settings", and "about"

2.1 "File(F)" contains "open (CSV)", "Real time acquisition", "Close acquisition", "Close".

2.2 Setting options contains "serial port settings", "curve settings", "data comparison settings", and "parameters settings"

2.3 "About" option, provide version information of the system for users

Toolbar : Includes 12 options: tracking display, zoom in and zoom out, cursor, window preview, attributes, save and print

2.4 Main window of display: The collected data are displayed in different ways, such as historical data and alarm record query etc. display area.

## 6.3 Set up equipment and communication settings

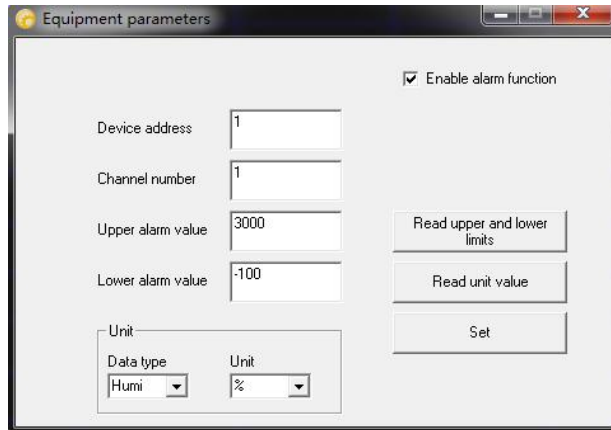
### 6.3.1

#### Set up equipment

In the "Settings" column, select the device parameters as shown in Figure 7-3 new device pop-up dialog box, the device name from the name, the device address for a device name, according to the need to select the corresponding channel number and the initial channel (default channel 1). Operation: 1) to build a new 16 channel equipment,

equipment type (choice of communication protocol, which \*\*w said wireless protocol) - >  
device name - > device address is 1 (default instrument address = 1) - > Channel 8  
channel number

- start channel 1; 2)



Picture 6-3 new device dialog box

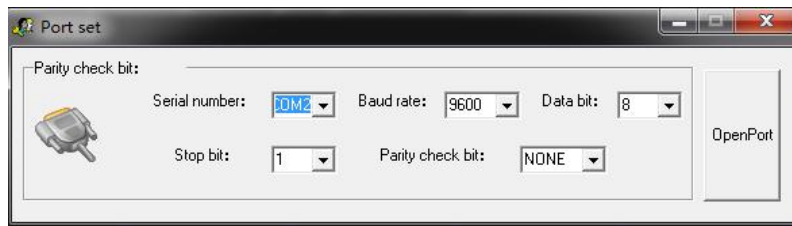
The system also provides more than 1 pairs of communication, that is, the system can simultaneously monitor multiple instruments. If you have more than one instrument to monitor at the same time, you can carry out the following operations: 1) in the instrument set up the system interface will be set to the address of the device 1, 2, 3..... In the system, the corresponding channels are respectively set up in the device, wherein the device address is set to be the same as the device address of the instrument. If there are two instruments, the first device address is set to 1, second sets of equipment to address 2; to build a device in the system: device name - > device address is 1 - > start channel 1; then set up another device: the device name - >

Device address 2 - - start channel 1.

#### 1) Serial communication

The instrument support serial communication which is connected through the RS232 of the computer and RS232 port of the instrument. You can click the drop-down box to choose. The baud rate is 9600 by default settings. Click on the serial port settings and open the serial port. As shown in Figure 6-4

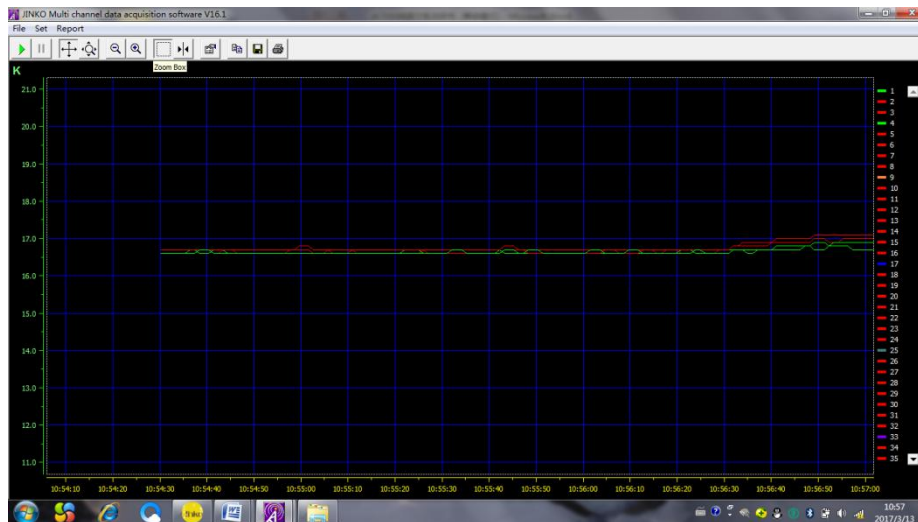
Show as picture 6-4



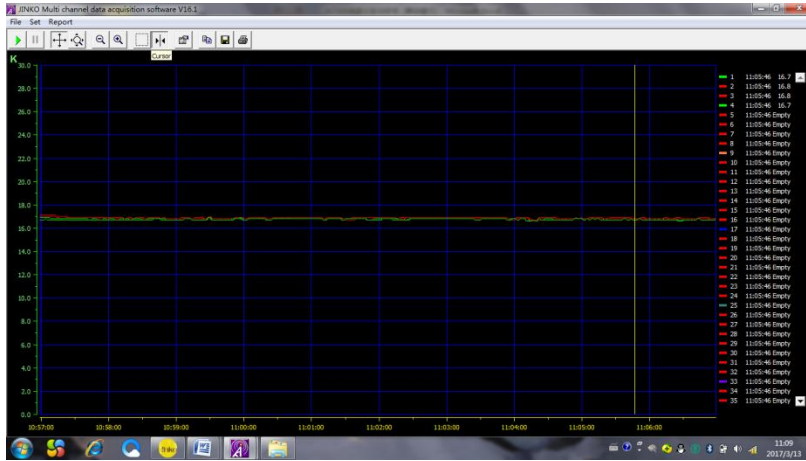
6-4 serial port settings

### 7.3.2 data display mode

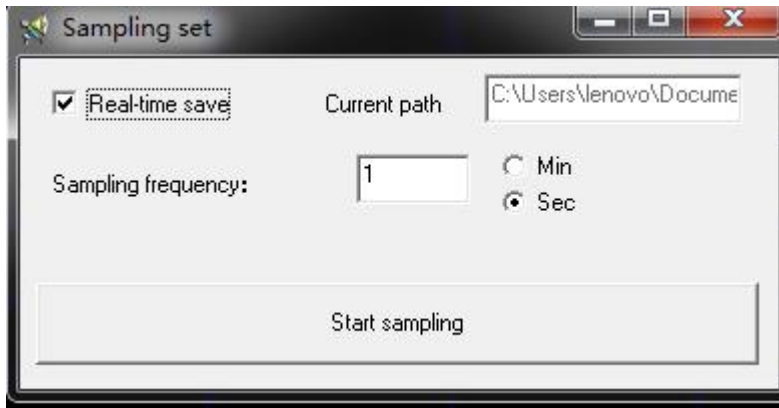
The system provides a variety of data display: curve, digital display, and integrated display. Double click the 1 column of the equipment, then set the curve can be selected, set the parameters, in the main menu bar "real-time" option in the toolbar or select a data display, here only to explain the choice of curve shows (Figure 6-5 default curve interface). As shown in Figure 6-6 in the main menu bar select "file" in the "real time collection" button to display the sampling settings window, start with the lower machine to establish communication, and select the save path and file name. After the start of the sample, the software will automatically read the data according to the sampling frequency and automatically save as Excel file format.



6-5 Curve interface



Data direct display



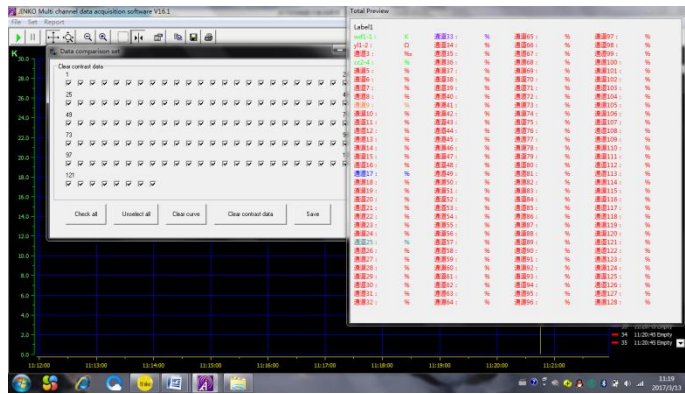
6-6 Save path

Total Preview

Label1							
wd1-1 :	K	通道33 :	%	通道65 :	%	通道97 :	%
yl1-2 :	Ω	通道34 :	%	通道66 :	%	通道98 :	%
通道3 :	%	通道35 :	%	通道67 :	%	通道99 :	%
cc2-4 :	%	通道36 :	%	通道68 :	%	通道100 :	%
通道5 :	%	通道37 :	%	通道69 :	%	通道101 :	%
通道6 :	%	通道38 :	%	通道70 :	%	通道102 :	%
通道7 :	%	通道39 :	%	通道71 :	%	通道103 :	%
通道8 :	%	通道40 :	%	通道72 :	%	通道104 :	%
通道9 :	%	通道41 :	%	通道73 :	%	通道105 :	%
通道10 :	%	通道42 :	%	通道74 :	%	通道106 :	%
通道11 :	%	通道43 :	%	通道75 :	%	通道107 :	%
通道12 :	%	通道44 :	%	通道76 :	%	通道108 :	%
通道13 :	%	通道45 :	%	通道77 :	%	通道109 :	%
通道14 :	%	通道46 :	%	通道78 :	%	通道110 :	%
通道15 :	%	通道47 :	%	通道79 :	%	通道111 :	%
通道16 :	%	通道48 :	%	通道80 :	%	通道112 :	%
通道17 :	%	通道49 :	%	通道81 :	%	通道113 :	%
通道18 :	%	通道50 :	%	通道82 :	%	通道114 :	%
通道19 :	%	通道51 :	%	通道83 :	%	通道115 :	%
通道20 :	%	通道52 :	%	通道84 :	%	通道116 :	%
通道21 :	%	通道53 :	%	通道85 :	%	通道117 :	%
通道22 :	%	通道54 :	%	通道86 :	%	通道118 :	%
通道23 :	%	通道55 :	%	通道87 :	%	通道119 :	%
通道24 :	%	通道56 :	%	通道88 :	%	通道120 :	%
通道25 :	%	通道57 :	%	通道89 :	%	通道121 :	%
通道26 :	%	通道58 :	%	通道90 :	%	通道122 :	%
通道27 :	%	通道59 :	%	通道91 :	%	通道123 :	%
通道28 :	%	通道60 :	%	通道92 :	%	通道124 :	%
通道29 :	%	通道61 :	%	通道93 :	%	通道125 :	%
通道30 :	%	通道62 :	%	通道94 :	%	通道126 :	%
通道31 :	%	通道63 :	%	通道95 :	%	通道127 :	%
通道32 :	%	通道64 :	%	通道96 :	%	通道128 :	%

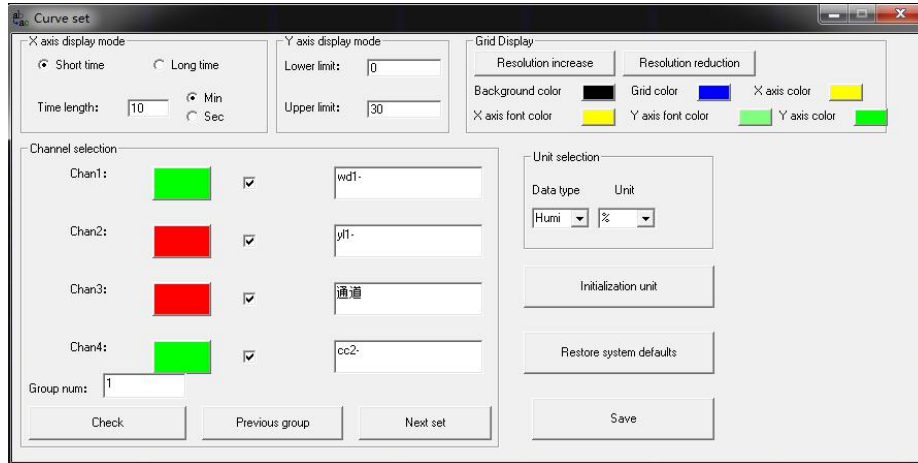
6-7 Digital display interface

remove total preview:



### 6-8 Integrated display interface

The parameters of each channel can be set in the column, select the appropriate channel click the left mouse button to set the device properties. The following figure 7-9 channel attribute set, this window can be arranged inside the device name: the name of the channel, channel number, channel unit, display color, background color, the X axis shows the time limit and offline operation of Y axis. Before collecting data, click on the initialization unit to keep the Y axis unit in line with the first channel.

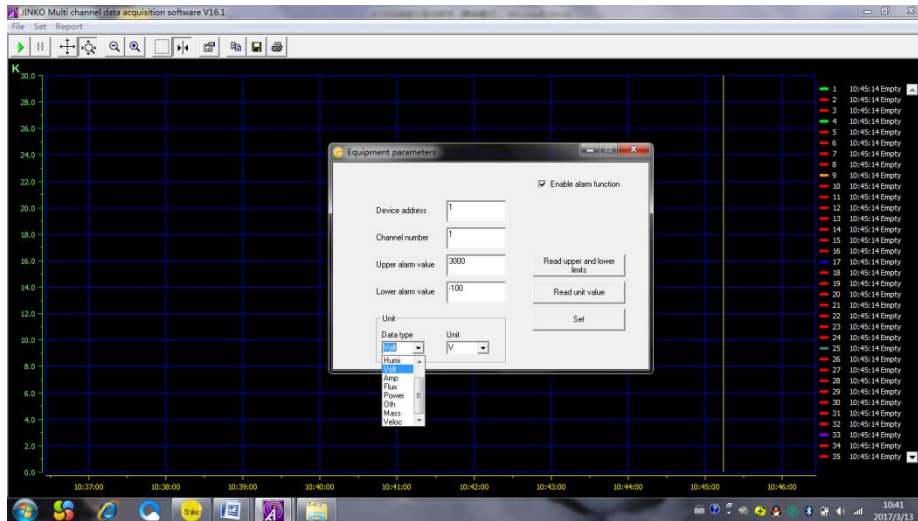


## 6-9 Settings of curve property

### 6.3.3 Alarm setting

The system provides users with intelligent alarm message service, this service needs to connect external SMS alarm equipment (computer terminal external wireless SMS alarm devices such as T3-DTU, shown in Figure 6-10, alarm equipment described below refer to T3-DTU device), is through changing the device to send SMS SMS message to notify the administrator according to the content of the message management, not sure whether or not to the scene. Specific settings: select the main menu bar in the "Settings" option, select "device parameters" to open the alarm function, as shown in figure 6-11.

The alarm is arranged below the interface can read or write equipment each channel of the upper and lower limit, mainly for alarm service, the lower limit is greater than the channel of data channel is less than the upper limit or channel, the instrument will display the alarm information. Read the upper and lower limits to see the upper and lower limits of the channel. The unit symbol can be consistent by reading unit values and the lower machine.



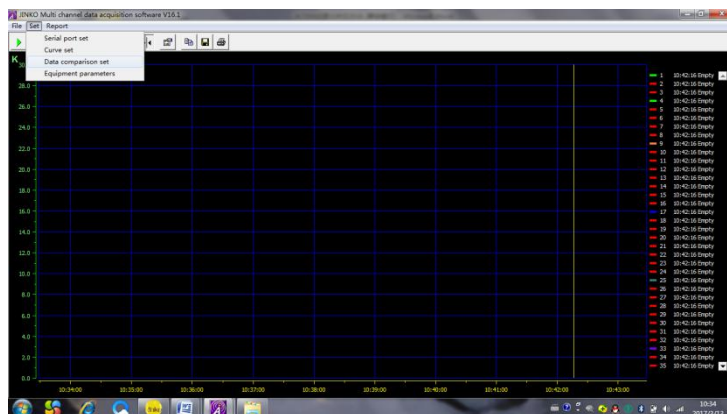
## 6-11 Alarm setting

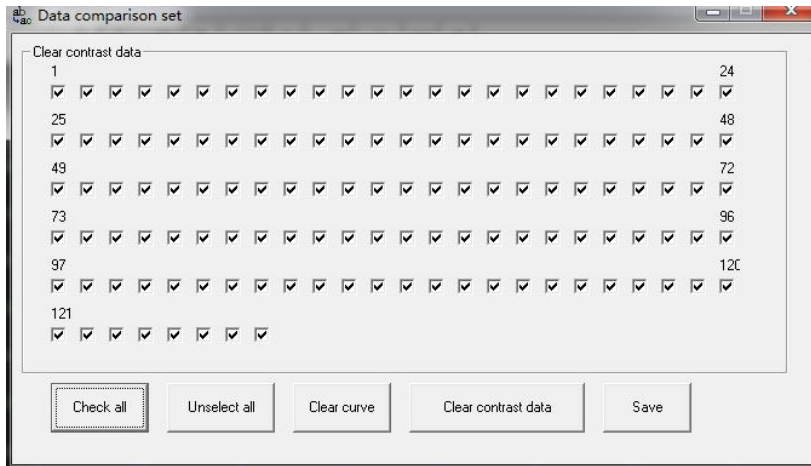
### 6.4.1 Select contrast channel

### 6.4.1 Query and export of records of the contrast channel

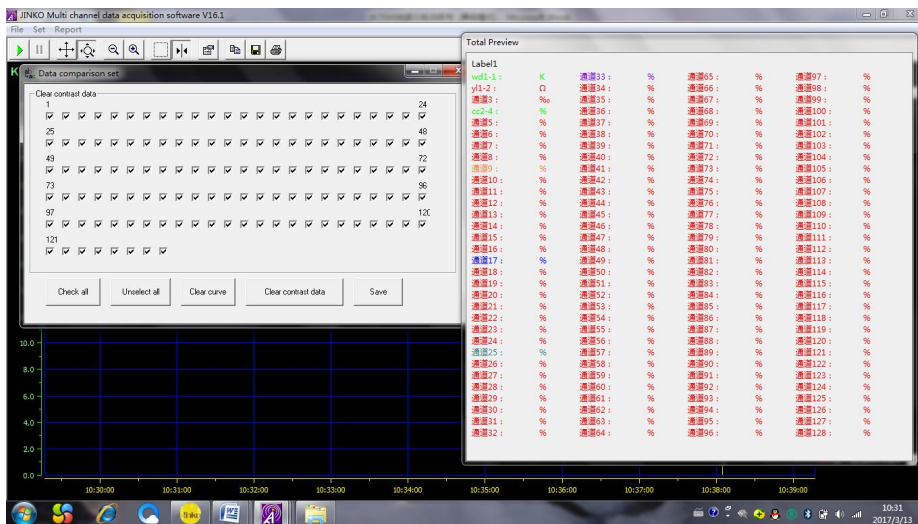
Click on the main menu bar "data set" under the "Settings" option. It will pop up chart

6-12 interface in the interface, you need to select the query data , and then click save, display overview preview as shown in Figure 6-13.





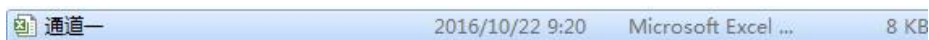
## 6-12 Contrast Channel




## 6-13 Overview preview

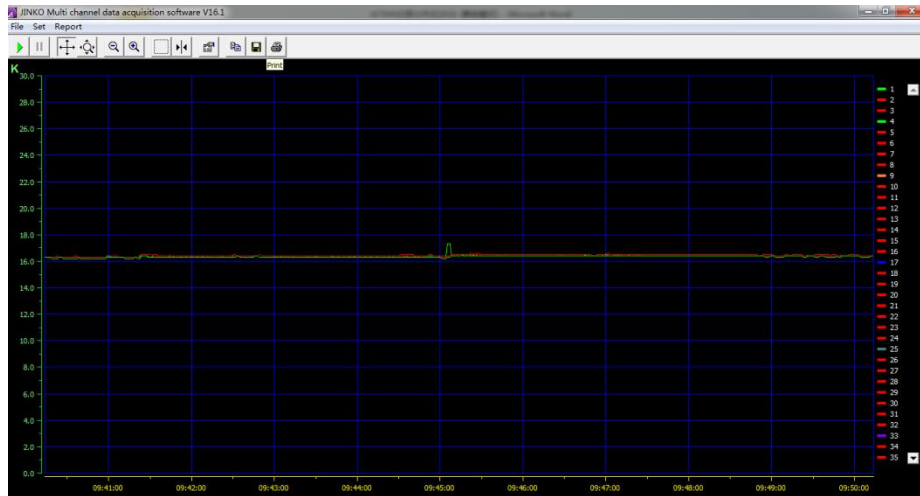
### 6.4.2 : Data from lower computer

The software supports reading data derived from lower computer. Click fast export data in the lower computer, after sampling, it will generate a excel folder in the root directory of U disk. The file name can be defined.



### 6.4.3 Historical curve data printing

Ways of printing historical data : back to 7-14 interface, click“”.




6-14 Print preview

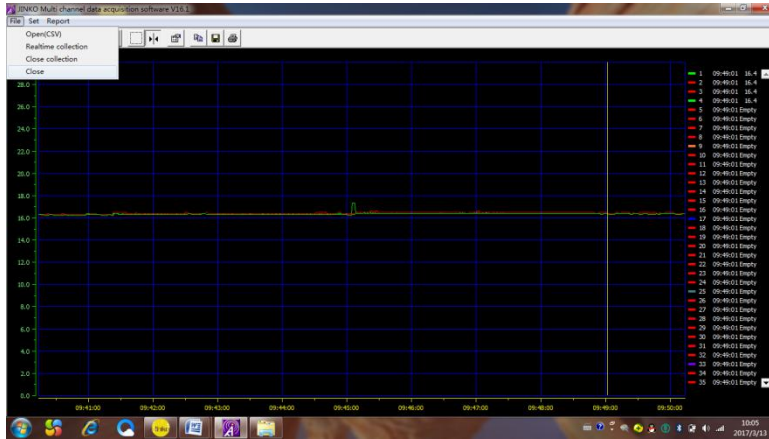
SP	Time	CH01	CH02	CH03	CH04
1	09:00:00	0.0	0.0	0.0	0.0
2	09:00:01	0.0	0.0	0.0	0.0
3	09:00:02	0.0	0.0	0.0	0.0
4	09:00:03	0.0	0.0	0.0	0.0
5	09:00:04	0.0	0.0	0.0	0.0
6	09:00:05	0.0	0.0	0.0	0.0
7	09:00:06	0.0	0.0	0.0	0.0
8	09:00:07	0.0	0.0	0.0	0.0
9	09:00:08	0.0	0.0	0.0	0.0
10	09:00:09	0.0	0.0	0.0	0.0
11	09:00:10	0.0	0.0	0.0	0.0
12	09:00:11	0.0	0.0	0.0	0.0
13	09:00:12	0.0	0.0	0.0	0.0
14	09:00:13	0.0	0.0	0.0	0.0
15	09:00:14	0.0	0.0	0.0	0.0
16	09:00:15	0.0	0.0	0.0	0.0
17	09:00:16	0.0	0.0	0.0	0.0
18	09:00:17	0.0	0.0	0.0	0.0

report printing

### 6.5 Exit system

Way 1: Click “x” on the top right corner of the system .

Way 2: Click the "File (F)" on the main menu bar. Choose “Close”.



6-15 Exit system

Wireless transmission mode:

Support virtual serial port, the computer must have a wireless receiver and virtual serial port software. After installation, open the virtual software to add a serial port.



After setting, click “Yes”.

Factory settings of the instrument is wireless AP (TCP Server) mode, wireless name:

金科仪器,

IP :192.168.11.254

If you connect laptop to the instrument, you need to change network connection to the 金科仪器 network so that it can achieve wireless communications

Open the temperature acquisition software. Change COM port to serial port in “settings” so that the print port can be equipped with printer model

## Seven, failure analysis and troubleshooting

The data recorder adopts advanced production technology and testing means, each of which has been strictly tested before leaving the factory, and has good reliability. In the course of using, common faults usually result from improper operation or parameter setting. If you find a malfunction that can not be handled, please record the malfunction phenomenon and timely notify the local agent dealer, you can also contact us directly.

The following are common failures in the application of data loggers:

Failure phenomenon	Cause analysis	Treatment measures
After the instrument is energized, it does not work and does not display.	Poor contact of power lines	Check power connector and switch.
Signal display is inconsistent with reality.	1.Incorrect setting of signal in parameter setting 2. signal wiring error 3. range type setting is not equal.	1.Check parameter settings 2.Use meter to measure whether signal is output or not. 3.Re power up, if the phenomenon still exists, please contact the manufacturer.
Under normal temperature, the temperature is not accurate.	Sensor type settings may be incorrect.	Check whether type settings are correct and determine what type of access sensors are.
Abnormal alarm output	1.Alarm limit setting error 2.Alarm points are shared by other channels.	1.Reset limit values 2.Cancel other alarm points
All temperature probes are under normal air temperature. The temperature of the first channel is not consistent with the temperature of all other passages, and the temperature of other channels is close to "0".	In the parameter setting of the instrument system, there is a "temperature rise" button set as "ON".	Set it to "OFF".
Channel measurement display: 00000	Test module insert failed or not inserted	Or contact with manufacturers.
Channel measurement display: 1999.9	Temperature sensor opens or contacts poorly.	Or contact with manufacturers.