content

I. Overview

Touch data recorder has been widely used in all walks of life because of its rich display screen, flexible operation mode and powerful recording, operation, control and management functions. This product absorbs the advantages of all kinds of data recorders at home and abroad, and applies 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-effective.

This product is equipped with color LCD touch screen display. It can receive many kinds of current, voltage and resistance signals, and realize the functions of displaying, recording, overshoot monitoring, report generation, data communication and flow accumulation of temperature, humidity, pressure, liquid level, flow rate, composition, force, moment, displacement and other physical quantities.

This product mainly consists of touch LCD screen, main board with multiple processors as the core, main power supply, power supply for external transmitter, data acquisition board, signal output board, large capacity FLASH, etc.

- ▶ Depending on the application requirements, it can be equipped with different types of intelligent data acquisition control boards.

- ▶ Product setup High capacity FLASH, can quickly dump data from FLASH to your computer via USB. The built-in FLASH has a capacity of 70m or more up to 2 gigabytes, and can be recorded for 720 hours at 10 seconds at 8 channels, and data for all channels at the fastest 1 second.

- ▶ Digital display interface, bar display screen, real-time (historical) curve screen, alarm data page.

- ▶ Historical curve reading cursor function.

- ▶ Measurement, showing basic error：±0.2% F·S

▶ The multi-point alarm function can be set with parameters.

II. **Functional characteristics**

This product shows a large amount of information, friendly interface, simple operation, the following are the main functional characteristics：

▶ No pen and paper records are required, day-to-day maintenance is minimal and running costs are low；

▶ High brightness touch color TFT LCD screen, CCFL backlight, clear picture；

▶ With multiple processors, multiple signal acquisition, recording, display and alarm can be realized at the same time.；

▶ Use 70MB high-capacity FLASH flash memory chip to store historical data, power down and never lose data；

▶ Fully isolated universal input, can input a variety of signals at the same time, do not need to replace the module, directly on the instrument can be set；

▶ Display a wider range of numeric values for engineering data to display 6-bit numeric value：-999.99~1999.99；

▶ Can carry on the parameter setting, displays the project tag, the engineering unit, has the flow accumulation and so on function；

▶ The display channel data display window has a red alarm display, while indicating the lower and lower limit, upper limit and upper limit of each channel, and 8-way relay alarm output (customized product)；

▶ The display precision is high, the basic error is±0.2% F·S；

▶ Built-in GB2312 Chinese character library, input using full-spelling input method；

▶ Support for external micro-printing, manual printing of data, curves, automatic timing printing of data, to meet the needs of user on-site printing (custom-made products)；

▶ Equipped with standard USB2.0 interface. Easy operation with mouse keyboard, quick and convenient transfer of output historical data；

▶ Standard serial communication interface, RS485 and RS232C with optical couple isolation and Ethernet communication；

▶ Support standard ModBus RTU communication protocol (optional function), in addition to supporting our data management software, but also support other configuration software；

▶ It can work normally in the wide voltage range of AC 85 V to 265V of the AC power supp；

▶ 4-way transmitter DC 24V isolated distribution；

▶ Ensure the instrument works properly in harsh environment through EMCIII level。

III. Technical indicators

3.1.display

7-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 channels contain a comprehensive interface)

Basic error less than ±0.2% F ·S, range of digital display-999.99 / 1999.99

Measurement resolution: 1x120000, 24-bit AD converter real-time curve recording interval of 1 second to 9999 seconds, corresponding whole screen curve time of 30 seconds to 300 minutes history curve viewing interval from 1 second to 9999 seconds can be set continuously.

3.2 Input signal and precision table

Input signals include DC current, DC voltage, thermal resistance, thermocouple and remote pressure gauge, which are selected by keys or touch screen input. Isolate universal input without jumper.

Input Typ		Range of measurements (value range)	Measurement accuracy (reference error, absolute error)	Digital display resolution
volts d.c.	0-10V	-0.5Vto+11.000V	0.001% F.S.　　±0.0001V	0.01V
	0-5V	-0.5Vto+5.500V	0.02% F.S.　　±0.0001V	0.01V
	±20mV	-21mVto+21mV	0.0025% F.S.　　±0.001mV	0.01mV
	±100mV	-110.0mVto+110.0mV	0.0005% F.S.　　±0.001mV	0.01mV
direct current	4-20mA	+3mAto+21.00mA	0.005% F.S.　　±0.001mA	0.01mA
			Measurement accuracy (relative error)	
thermocouple	K	-60℃to+1372℃	±(0.05% rdg. +0.5℃)	0.01℃
	J	-200℃to+1200℃	±(0.05% rdg. +0.5℃)　≤0℃ ±(0.15%rdg.+0.5℃)	0.01℃
	E	-200℃to+1000℃	±(0.05% rdg. +0.5℃)　≤0℃ ±(0.15%rdg.+0.5℃)	0.01℃
	T	-200℃to+400℃	±(0.05% rdg. +0.5℃)　≤-30℃ ±(0.15%rdg.+0.5℃)	0.01℃
	N	-200℃to+1300℃	±(0.05% rdg. +0.7℃)　≤0℃ ±(0.3%rdg.+0.7℃)	0.01℃
	W	+1500℃to+2315℃	±(0.05% rdg. +1.5℃)	0.01℃
		0℃to+1500℃	±(0.05% rdg. +1.0℃)	
	R	+800℃to+1768℃	±(0.05% rdg. +1.0℃)	0.01℃
		+400℃to+800℃	±(0.2% rdg. +2.0℃)	
	S	+800℃to+1768℃	±(0.05% rdg. +1.0℃)	0.01℃
		+400℃to+800℃	±(0.2% rdg. +2.0℃)	
	B	+800℃to+1820℃	±(0.05% rdg. +1.0℃)	0.01℃
		+400℃to+800℃	±(0.2% rdg. +2.5℃)	
hot resistance	Pt100	-200℃to+660℃	±(0.05% rdg. +0.3℃)	0.01℃
	Cu50	-50℃to+150℃	±(0.05% rdg. +0.3℃)	0.01℃
	PT1000	-200℃to+300℃	±(0.05% rdg. +0.2℃)	0.01℃
preheating time		More than 30 minutes		
thermocouple measurement		Including cold end compensation precision		
Standard operating status (above precision)		The temperature is 25 ±3 ℃, the humidity is 55 ±10%, and the power supply is 8-28 V DC.		
adaptive capacity to environment	Using temperature	-20℃to+70℃		
	Using temperature	0to95%RH(No condensation）		

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3.3 Alarm Output

Relay output: Contact capacity AC 220V, 2A, resistive load;

The output of 16 points can be set by parameters, and can be set by the value of each alarm point of the channel.

3.4 External Power Supply

DC 24V power supply: used to supply power to the transmitter, the maximum load capacity is less than 200 mA.

3.5 Communication Printing Interface (Optional Function)

Photoelectric isolation

Standard RS232, RS485 communication; Ethernet communication standard should be noted when ordering.

Communication Rate 9600 Set Selection.

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

Optional Modbus RTU protocol to communicate with the host computer.

3.6 Power Supply Conditions

AC 220V power supply instrument: AC 85 ~ 265V, power consumption is less than 20VA;

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

3.7 Environment and Others

Work temperature range: - 10 ~50

Storage Temperature Range: - 20 ~70.

Working humidity range: less than 85% R. H, no condensation

Weight of Instrument: Max. 2.8Kg

3.8 Recording Time

The length of recording time is related to the available capacity of FLASH memory (available capacity = total capacity - used capacity (internal program is usually 10M), recording interval and input points. In order to facilitate user's channel expansion in the future, the number of recording channels is set to 64 channels. The calculation formula is as follows:

$$hour = \frac{（70\text{-}2）\times 256 \times 8 \times \text{interrecord gap } S \times 24}{\text{number of channels} \times 27 \times 25}$$

IV. Installation and wiring and configuration

4.1 Dimensions of form and mounting openings

❶ In order to ensure safety, the wiring must be carried out after the power is shut down.

❶ Ac-powered instruments, of which The (PG) end is the common end of the power filter, has high voltage, can only connect to the earth, and is forbidden to connect with the other terminals of the instrument.

The basic wiring diagram given in this specification is limited by the number of terminals. When the instrument function conflicts with the basic wiring diagram, the wiring diagram is based on the random description.

Instrument dimensions and mounting openings are as follows：
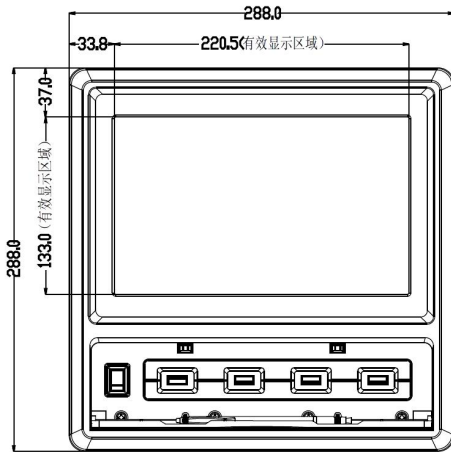
Overall dimensions：288×288×200mm
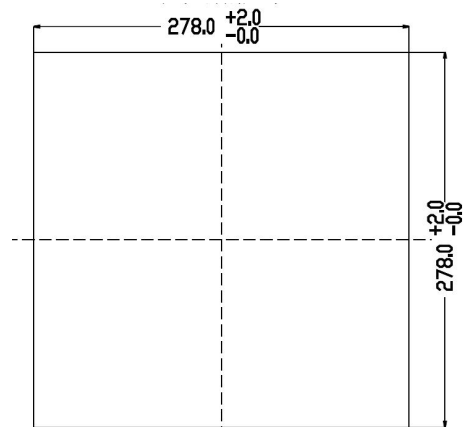
Install opening dimensions278×278mm

4.2 wiring terminal diagram
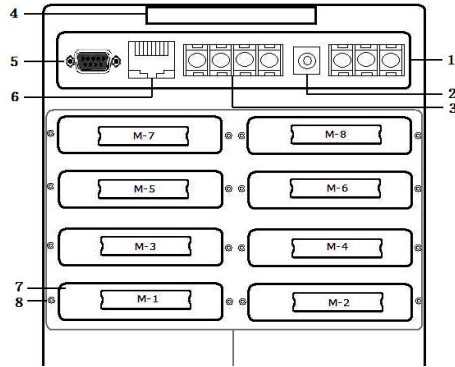
Measuring device mounting groove

The sequence of module installation in the figure is from the lower left corner M1 (channel 1-8) to the right M2 (channel 9-16) and then to the upper left M3 to the right M4. The top left M7 and the right M8 (channel 57-64). The relay signal output module is generally inserted into the M8 position by default.

1------ ac ac85-265v power input terminal
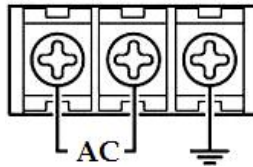
----- dc DC24V input terminal

----- dcDC24Voutputand485signalinputterminal
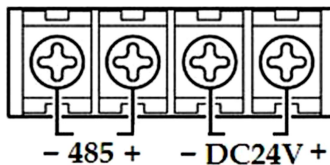
ThisRS485   communication port data acquisition module plug-in extension input interface, can not be used as communication with PC or other equipment (communication with

other equipment with 9 pin RS485), DC 24V for external sensor power supply output interface.

4 -- -- -- -- -- - the handle

The second needle of 5-RS232 and RS485 communication interface is the "RD" (RS232) of the instrument, the third needle is the "TXD" (RS232) of the instrument, the fifth needle is the communication "ground" of the instrument, and the 4 needles are RS485+, 9 needles RS485-; 1 is RS485+, 6 RS485-.

6 -Ethernet interface

measuring module device installation slot

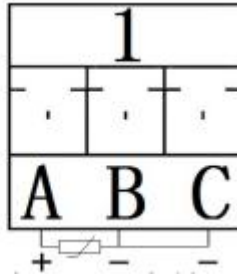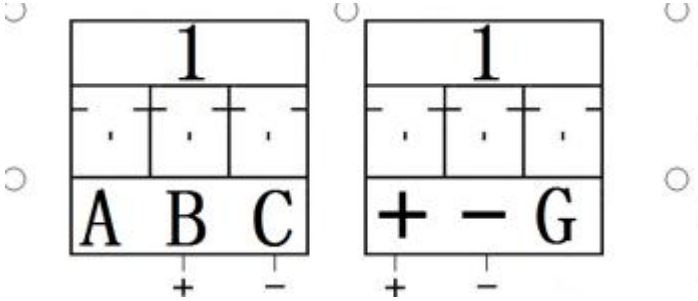 8-fixed measuring device screw 4.3.1 input signal connection mode

4.3.1Input signal wiring mode
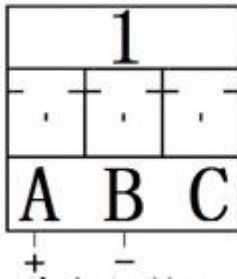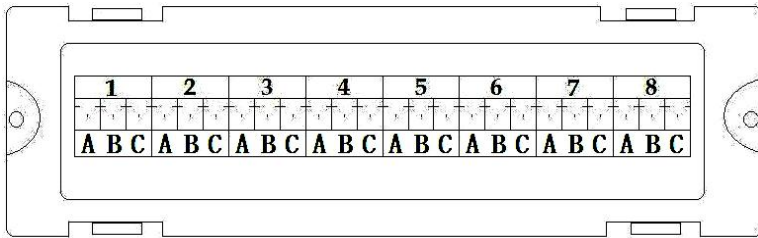
Thermocouple input   Current signal input
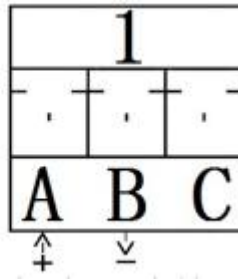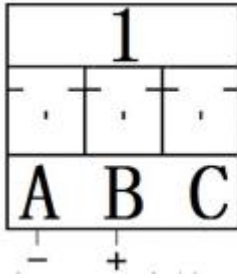
Voltage signal input   Resistance input
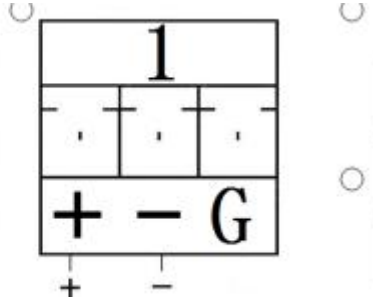
Switch signal input   relay connection

In addition to the above signal input and output, there is temperature and humidity acquisition module (TP1728), temperature and humidity acquisition module wiring signal is digital signal, TP2305 temperature and humidity sensor has three wires, after the instrument leaves the factory, the manufacturer will connect the line. There is no need for the customer to connect separately. 1 / 8 represents eight channels, A, B, c represent three terminals of one channel, thermocouple signal input: a foot signal input is positive, B foot signal input is negative; , the current signal input: the A foot connection signal input is positive, the B foot connection signal input is negative, the voltage signal input: the B foot connection signal input is positive, the A foot connection signal input is negative;

Resistance signal input: three-wire PT100 platinum resistance connection A, B, c foot, B and c connected with the same color line, A foot alone; switch signal input: B foot signal input positive, c foot signal input negative relay Yu out +-foot

4.3.2 input signal wiring (when the terminal is combined with the acquisition module, do not disassemble, disassembly will lead to damage to the wiring module), the above wiring module is specially customized.

The display screen looks like this：
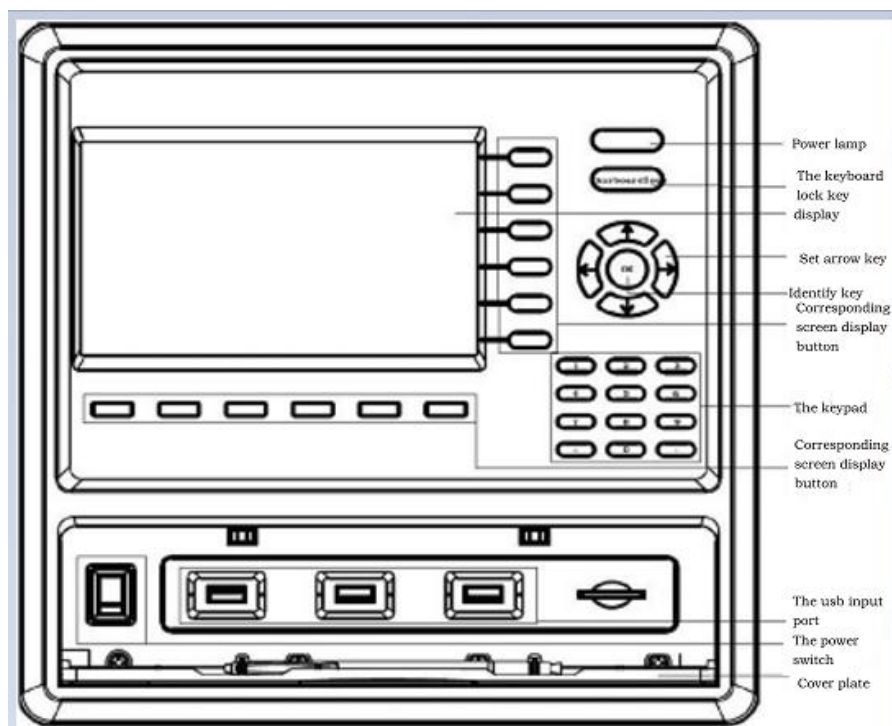
Multiplex data recorder

When the instrument is connected to the power supply, the boot-up interface of the display system is

displayed. After the boot-up system is completed, it enters the real-time numerical display interface. Next, the keyboard operation, operation display screen and parameter setting screen of the instrument are introduced respectively.

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

system parameter setting

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

Instrument parameter setting

The channel parameter setting screen is used to set the signal type, station number, engineering unit, upper and lower limit of measurement range, filter constant, flow parameter setting (small signal removal, square root), cumulative, alarm upper limit, alarm upper limit, alarm lower limit, alarm lower limit, etc.

The channel number and measurement unit can be modified by clicking on the settings and entering the parameter settings.

Signal type

This instrument supports a variety of signal types, in which analog signals support universal input, changing different signal types, as long as the terminal wiring is changed and the corresponding signal type is set here. When setting the signal type, please pay attention to the same signal as that of primary instrument or detection element.

Squaring and Small Signal Excision

Squaring is used in conjunction with small signal excision, and the range of small signal excision 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, and the engineering is generally treated as zero.

Transmit output

There are three parameters about the transmission and output: the output channel, the upper limit of the transmission and output, the lower limit of the transmission and output, and the output signal type has been set at the time of leaving the factory. These parameters are placed in the channel parameter setting screen. The range of the output channel number is 1-8, and the mode of use is explained separately (when ordering).

On the Operational Functions of Channels (Virtual Operational Channels)

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. The operation mode includes addition, subtraction, multiplication and division. Operations can only participate in physical channels.

5. 1 Running screen

During the operation of the data recorder, the pictures displayed are running pictures, including numerical display interface, bar picture interface, curve interface, alarm interface, and setting buttons, parameters setting, system setting and other pictures. Among them, display interface, bar picture and real-time (historical) curve picture are commonly used basic pictures. An integrated interface is added to the 8-channel screen. The time in the upper right corner of the screen is displayed as the current date and time.

5.2 Boot screen

The screen displays the click screen to enter the Startup Properties window, so we don't need to click on the screen and let the screen go directly into the startup screen.

5.3 Display interface

The display interface can have a comprehensive understanding of the current situation, including channel name, measurement value, unit of engineering quantity, alarm indication, alarm output status, and so on.

5.4 Digital display interface

The 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 by setting the setting button to select the number of channels to achieve the desired number of channels display

interface. The following figure shows the 16-channel display interface.
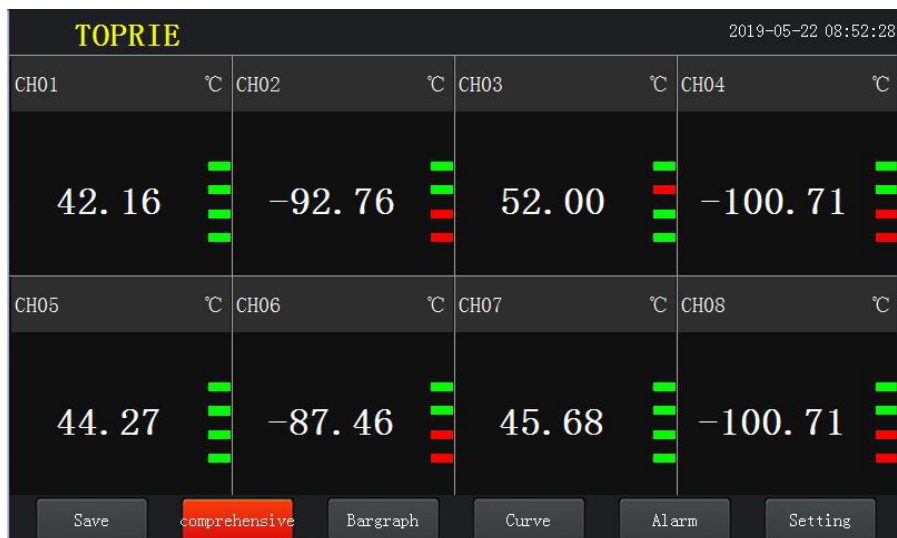
Preservation

Display interface

Bar graph interface

Curve interface

Alarm interface

Set up

The following figure shows the details of a single channel, including the channel name, units, measurements, and alarm signs. Alarm signs from top to bottom for the upper limit alarm, lower limit alarm. When the value is normal, the alarm sign is green, and when the alarm value is exceeded, the corresponding alarm sign will change from green to red (or: when there is an alarm, The corresponding alarm sign will change from green to red) the alarm value can be set in the parameter setting.

Name.Unit. Channel type. Minimum limit. The lower limit. Upper limit. The maximum limit. Range. Close.

Clicking on the area in the box will bring up a small window showing the basic information of the channel, as shown in the figure above.

Presentation of button function on display screen:

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

Save: When setting parameters, the current set parameters are the initial set parameters and written to disk to prevent sudden power failure and loss of set parameters when setting parameters. (Now the

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product has been upgraded to the instrument system, using the way of automatically saving parameters, without using the save button)

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

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

Serial number. Start time. End time. Alarm message. The channel is above the upper limit. Set up. Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up.

The channel 16 is above the upper limit。

The channel15 is above the upper limit。

The channel14 is above the upper limit。

The channel13is above the upper limit。

The channel11 is above the upper limit。

The channel10 is above the upper limit。

The channel9 is above the upper limit。

The channel8 is above the upper limit。

Settings: displays the settings button under the interface, which allows you to enter parameter settings and system settings. Click Settings to select parameter settings (the new instrument does not have a password from the factory, the password is blank and click OK)

Number of channels. Name. Channel number. Type. Measure range. Units. Accumulate. Open. Vacuum. Filter. Remove. Aisle。 Electrocution. adjustment。 Clear accumulation. Copy. Paste. Export data. Return.

Minimum limit. The lower limit. Upper limit. The maximum limit.

In the parameter setting interface, each parameter can be set, showing the number of channels, channel

name, channel number type, range, unit and other parameters. For vacuum, cumulative, vacuum, square

Filtering and cutting buttons are set for custom-made products, such as gas flow, water flow, etc., which are described in addition to the flow test products.

System setup Interface

Under this interface, you can set "button entry password, alarm switch, storage interval time, instrument system time, screen saver switch and screen saver time, network port communication IP address and other information," The telephone number at the back is the mobile phone number set for the GPRS SMS alarm of the custom type model. On the right side there is a record of the system version number, which facilitates the confirmation of the after-sale maintenance system. There is also a brief help explanation for the use of the instrument.

5.5 Integrated interface

The integrated interface is only for the 8-channel display interface, as shown in the following figure. In the integrated interface, digital display interface, real-time curve interface, bar graph interface and average bar graph display interface are integrated together. Give customers a new experience of browsing world.
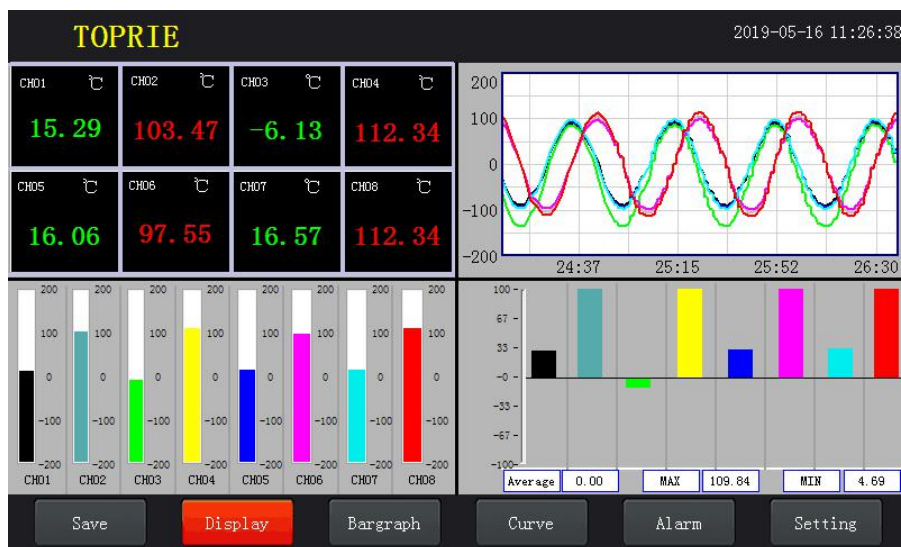
Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up.

Average, maximum, minimum.

5.6 (bar chart) bar chart display screen

Bar drawing interface: Switch button, press this button to switch to the bar drawing interface. The bar picture is divided into four screens, namely "1-16 bar picture", "17-32 bar picture", "33-48 bar picture" and "49-64 bar picture". The switch page is carried out in the mode of cyclic page turning. The following picture is a 1-16 channel bar picture.

Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up

The image above shows the details of the bar interface channel, which contains the channel name, number and percentage bar display. The bar 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 fill color will turn red, the display unit is a percentage.

5.7 (Curve) Real-time Curve Screen

The current curve record only preserves the display data of a single screen and can change the speed of display refresh by changing the Y axis and the X axis of the time scale according to the need of observation. The curves are consistent and do not affect the time interval of the FLASH record.
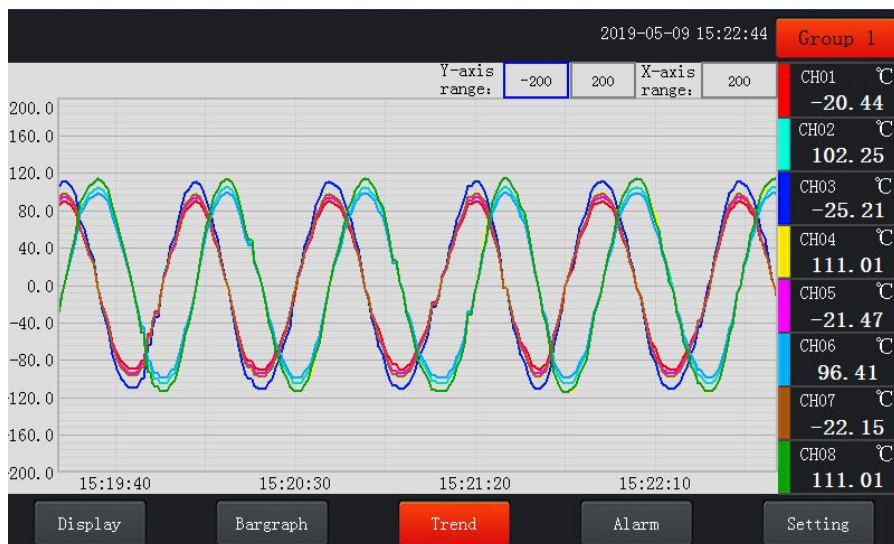
Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up

Curve combination1

Display the current channel measurement, channel number, position number, unit of quantity, curve run interval, alarm status under the real-time curve.

Range setting: there is a label above the real-time curve screen that allows you to set the X, Y axis range, 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 screen and bar interface, the button in the upper right corner is the switch button, through which more channels of real-time curves and diachronic curves can be viewed.

5.8 Historical curve picture

The FLASH record is used for long-term data preservation, and the recording interval is usually long; the recording interval is from 1 second to 9999 seconds, and the recording interval of each channel is the same. According to the needs of the production process, the reasonable setting of the FLASH recording interval, taking into account the contradiction between the recording interval and the time, can

accurately reflect the change of the process parameters. (set recording interval the setting button under the display interface to enter the system parameters Test set recording interval time as described below)
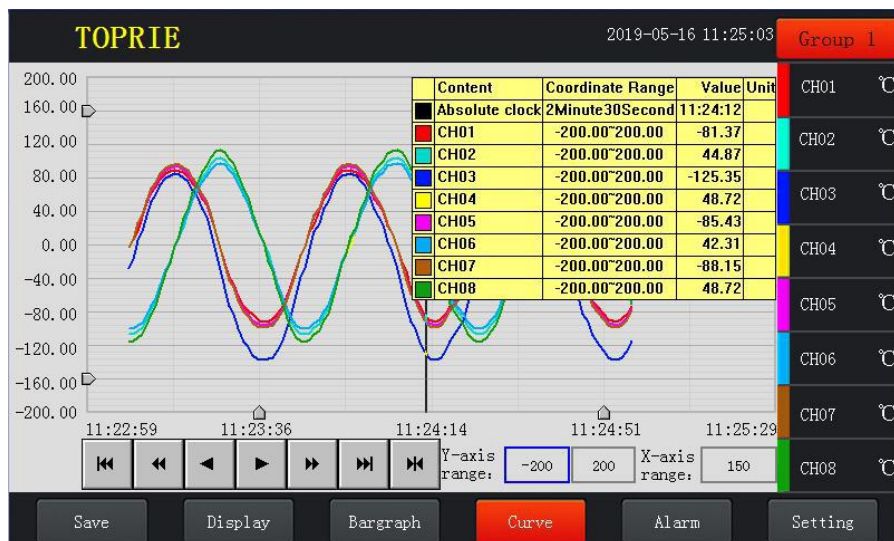
Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up

   Curve combination 1

Content。 Units. Current value, unit.

X value. Y value.。

   The time scale in recall mode can not be changed, which is determined by the interval between records stored in FLASH.

   In the recall mode, the time is displayed as the starting point on the right side of the curve.

   The alarm status indicator in recall mode is still real-time alarm status rather than record status.

   The reading cursor mode is used to accurately display the values of each point of the recall 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 becomes the time at which the cursor is located. In cursor mode, you can't recall forward or backward.

The functions of the buttons shown in the figure below are as follows: scrolling one page to the left of the X-axis, half page to the left of the X-axis, one main scribe position to the left of the X-axis, one main scribe position to the right of the X-axis, half page to the right of the X-axis, and one page to the right of the X-axis.

The function of the rest of the interface buttons is similar to the real-time curve display screen.

1-if the recorder has ever lost power because there is no data record during the period of power down, there will be discontinuities in the track-up < 2 curve, and the historical data will not be lost.

5.9 Parameter setting Interface

The channel parameter setting screen is used to set the signal type, position number, engineering unit, range upper and lower limit, filter constant, flow parameter setting (small signal excision, squared), cumulative, alarm upper limit, and so on. Alarm lower limit, relay output contact number selection and so on.

Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up

Clear accumulation. Copy. Paste. Export data.

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

Channel: Channel selection, the selection of a channel, and then set the following name, type, unit, range, lower limit, lower limit, upper limit, upper limit, adjustment are the channel property settings.

Contact: The alarm output point used to set the lower or upper limit value, and the channel number used to trigger the action of the relay.

Name: Name of channel.

Type: Type of channel.

Unit: Channel unit.

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

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

Adjustment: Correct and adjust the channel value to show the ideal value. By adjusting the K value to adjust the temperature multiplier (multiplication and division), adjusting the b value can adjust the size of the positive and negative values of the value.

Button function

Clear Accumulation: Clear all inventory data.

Replication: You can replicate the parameters of a channel.

Paste: Paste the replicated channel parameters to the current channel.

Data Export: Switch button to enter the "Data Export" interface by pressing this button (insert the U disk of the imported data into the USB port of the instrument).

The disk is expected to be stored for 128904.5 days

 terminal time

start time

Action Tips:

1. Insert the U disk before using the valid export

2. When the export operation is performed, remove the U disk after you see the "Export end!" prompt

3. Due to limited storage space in the system, please export important data in a timely manner

Export data quickly. Data export. Return

The Data Export button contains two buttons: Quick Export Data and Export Data.

The difference between fast exporting historical data and exporting historical data:

1. Quick export of data

Advantages: Fast speed. When the data in the instrument reaches tens of thousands, it takes about 30 seconds to export all the data. It does not support the choice of time interval when the data is exported quickly, that is, to export all the historical data in the instrument.

Disadvantages: 1. The instrument will stop data acquisition and storage during the period of export data, that is, other processes are in a dormant state except the process of fast export of historical data, when the data export is completed, they will be awakened to execute; 2. Exported data is stored in the U-disk data folder, and the generated data documents need to be opened and checked by the company's PC-specific software. Read.

II. Data Export

Advantages: 1. In the stage of data export, the instrument can still perform data acquisition and storage functions, that is, other processes are still executed without dormancy processing, at the same time, it can set the selected time period for data export. 2. The exported data is stored in the U disk root directory and named in time. It can be opened and consulted by Excel table. (If you want to consult with

PC software, you can't change this file, otherwise PC software will not recognize the file.)

Disadvantage: The speed of data export is slow, that is to say, it takes a long time to export. If the data reaches tens of thousands, it may take more than ten minutes or more to export the data.

The above is the difference between the two, users need to operate according to their own needs.

Language: Language selection switch button, can be displayed in Chinese and English two operating languages.

5.10 System Parameter Settings Interfac

System parameters settings include: date, recording interval, password setting, network port communication IP settings, device address, buzzer alarm, temperature rise, screen saver, settings, And mobile SMS alarm settings (customized SMS alarm function needs to be used in conjunction with the GPRS

module).

System time. Password setting. Storage interval. The temperature rises. Screen saver time. Alarm sound. Device address. Local IP. System version. Help explain. Factory setup.

Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up

Date: sets the date and time of the current system.

Recording interval: the interval of the data disk, setting the recording interval time has a direct impact on the exported data density.

Password settings: click to enter user Manager, you can modify the user password, new users, delete users and other operations.

Buzzer alarm: click switch buzzer alarm function.

Screen saver settings: set the screen saver on and off, on the status can set the screen saver time, after setting the time instrument display screen will not light up, into the power-saving status, so that the display screen again lit, just touch the screen.

Temperature rise: this is used for measuring the temperature rise of electrical switch contact devices. When measuring the temperature rise, we can choose ON, normal temperature measurement. We set the OFF state. When the ON state instrument is selected, the temperature value of the first channel is subtracted from the second channel to the last channel, and the temperature value of the other channels is one temperature value higher than the temperature value of the first channel. At this point, the temperature probe of the first channel should be placed in the air.

Ethernet Port Communication feature Settings:

10-inch screen recorder network port communication IP settings: look at the router instructions, the IP address of different types of routers are different, some are 192.168.1.1, some are 192.168.0.1; Take: 192.168.1.1 as an example: the IP address is set to: 192.168.1.c, the * number can range from 2 to 254, and the IP address used in the LAN cannot be set. The IP setting in the software should be consistent with the instrument, and the target port should be set to 3000.

SMS alarm settings:

This function is designed for the instrument of short message alarm function, and the short message sending module of GPRS is used to send the short message, as long as the telephone number of the short message that needs to be received is inputted.

5.11 Alarm interface

Alarm interface includes browsing table and scroll bar to display alarm information. Browse the table can query the alarm data at any time, the scroll bar only displays the current alarm information. By browsing the "Settings" button in the lower right corner of the table, you can enter the small window of "set time range" and set the time to query the alarm information.

Serial number, start time, end time, alarm message. The channel is above the upper limit.

Reservation. Display interface. Bar interface. Curve interface. Alarm interface. Set up

V. Communication setup and protocol

Communication is through the communication interface, the computer can read the measured values

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of each channel, alarm status. Read all the parameters of the instrument, and set the parameters.

This series of data recorder provides users with two standard interfaces for communication with the upper computer, RS-232,RS-485,RS-232 is suitable for point-to-point short distance communication, and it is mainly used for the communication between the instrument and the portable computer. RS-485 communication is suitable for long-distance point-to-multi-point communication. It is mainly used when multiple instruments are connected and communicated with computers. Which communication mode is selected by the user depending on the needs and specific circumstances. The instrument adopts ASCII and MODBUS communication protocol. And provides the connection with various industrial control software such as parameter setting software.

6.1. Overview

RS-232 mode allows only one upper computer to hang one recorder. This communication method is suitable for users who use portable computers to read the data of the recorder at random, or to connect the wireless data transmission station for remote wireless transmission or to connect the data and curves in the serial micro-printer print recorder.

RS-485 mode allows one host computer to hang multiple loggers at the same time. This communication mode is suitable for the users who use the terminal to form a network with this series of instruments, to receive the data of the recorder in real time and to connect with all kinds of control systems.

6.2. RS-232 communication mode

RS-232C communication interface, the user can only connect one end of the RS-232 three-core communication line to the instrument RS-232C interface and the other end to the serial port of the portable computer (or PDA), so that the RS-232 communication can be realized.

In the parameter setting of the recorder system, the communication address and the Porter rate are selected well, and the corresponding settings are made in the computer management software, so that the communication of the RS-232 mode can be carried out.

The wiring to the computer is as follows:

Communication interface wiring definition

仪表外置RS232C通讯接线端子   计算机RS232C通讯接口
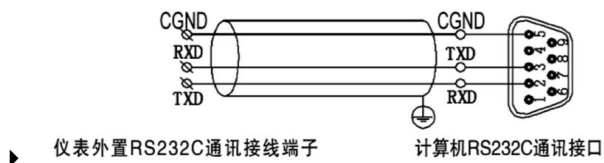
Channel interface wire connection definition

Instrument setup RS232C communication terminal

Computer RS232C communication interface

ChartRS-232 Communication connection method (instrument internal 2, 3 feet cross-connect).

Diagram RS-232 communication connection method (instrument interior 2, 3 feet cross-connect).

6.3 RS-485 communication mode

The RS-485 communication line of this series of data recorder adopts shielded twisted pair, one end of which is connected to the serial communication port of the computer through the RS-232/485 conversion module, and the other end is connected to the communication terminal of the
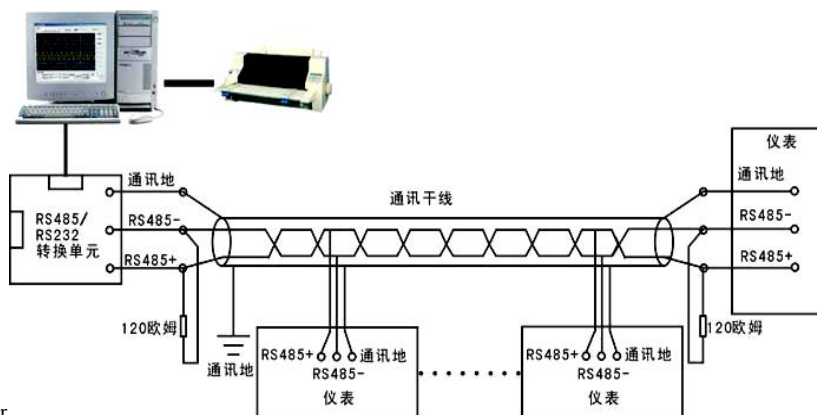
recorder.

Link unit

Communication place

Communication trunk line

appearance

ohm

The connection mode is shown as follows:

In the parameter setting of the recorder system, choose the communication address and baud rate (fixed at 9600).

The shielding layer of the double core shielding wire acts as the communication ground wire, and it should be noted that it can not be connected with the equipment protection. When the transmission distance is long, the two ends of the transmission trunk need to be connected between RS-485 communication line "+" and "-" by adding a terminal resistance of 120_respectively.

When a computer hangs up multiple recorders, the network topology is bus type, and each recorder is connected to the trunk through branch lines. It should be noted that the terminal resistance should be connected to both ends of the communication trunk, and the branch transmission line should be as short as possible to reduce interference.

The relay module can be selected when the communication distance is long.

6.4 Communication Test

After connecting the computer to the recorder, check whether the baud rate and device address of the

host computer and the recorder are consistent. The "serial debugging assistant" sends commands to the recorder to see if the recorder responds.

6.5 Communication Interface

RS-232/RS-485, Ethernet interface.

6.6 Modbus RTU

The communication between computer and temperature recorder is based on Modbus protocol.

ModbusRTU communication command:

	FC	function	Send frame	Receive frame
1	0x03	Read one or more register data	Device address: 0xXX Function codes: 0x03 Starting address High: 0xXX Starting address Low: 0xXX Register number High: 0xXX Register number Low: 0xXX CRC check Low: 0xXX CRC check High: 0xXX For example, send: 01 03 00 00 00 08 44 0C	Device address: 0xXX Function codes: 0x03 Data length n: 0xXX Data 0: 0xXXXX ... Data NAO 1: 0xXXXX CRC check Low: 0xXX CRC check High: 0xXX Reply:01 03 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 E4 59
2	0x06	Write a single register data		
3	0x10	Write multiple register data		

4	0x11	Read device Information		

6.7 Generation of CRC

The cyclic redundancy check (CRC) field is two bytes and contains a binary 16-bit value. The value of the crc attached to the back of the message is calculated by the transmitting device. The receiving device recalculates the value of the CRC when the message is received, and compares the calculated result with the actual received CRC value. An error if the two values are not equal.

The CRC is generated by:

(1) Load a 16-bit register into hexadecimal FFFF (all 1). Call it the CRC register.

(2) The first 8-bit byte of the message is either different from the lower byte of the 16-bit CRC register, and the result is put into the CRC register.

(3) Move the CRC register 1 bit to the right (), MSB zero in the direction of LSB. Extract and detect LSB.

6.8 Modbus TCP

ModbusTCP communication command：

	FC	function	Send frame	Receive frame
1	0x03	Read one or more register data	Transaction Meta-indicator High:0xXX Transaction Meta-indicator Low:0xXX Protocol High:0x00 Protocol Low:0x00 Length High:0x00 Length Low:0x06 (the length is the number of bytes in the orange section	Transaction Meta-indicator High:0xXX Transaction Meta-indicator Low:0xXX Protocol High:0x00 Protocol Low:0x00 Length High:0xXX Length Low:0xXX (the length is the number of bytes in the orange section

			below)	below)
			Device address: 0xXX	Device address: 0xXX
			Function codes: 0x03	Function codes: 0x03
			Starting address High: 0xXX	Data length n: 0xXX
			Starting address Low: 0xXX	Data 1: 0xXXXX
			Register number High: 0xXX	....
			Register number Low: 0xXX	Data n: 0xXXXX
			CRC check Low: 0xXX	Reply:00 01 00 00 00 13 01 03 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 6D AB
			CRC check High: 0xXX	
			For example, send:	
			00 01 00 00 00 06 01 03 00 00 00 08 42 E9	
2	0x06	Write a single register data		
3	0x10	Write multiple register data		
4	0x11	Read device Information		

6.9 Register address list

parameter	Register address		register name	content	operate
classification	sixteen	decimal system			
survey measure	00-7FH	0-127	TempValue [0] …… TempValue [127]	Temperature measurements, 64 channels.	read only

Set Parameter	A0 H	160	ChannelNum	number of channels	read only
	A1 H	161	AIUpLmt	Alarm upper limit value	read-write
	A2 H	162	AIDownLmt	Alarm lower limit value	read-write
decimal digits	AB H	171	Dot[0] …… Dot [127]	Corresponding to the number of decimal points of each channel, a total of 64 channels.	read only

For example, when reading the temperature values of 16 channels：

sent：01 03 00 00 00 20 44 12

receive：01 03 40 00 03 0D 36 00 03 0D 36 00 03 0D 36 00 03 0D 36 00 03 0D 36 00 03 0D 36 00 03 0D 36 00 03 0D 36 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 6C 84

VI. Instructions for the use of communication software

7.1 rie installation of data Recorder Monitoring system

Download the installation recorder to the official website with the upper computer software rie data logger monitoring system-installation package, temporarily shut down and exit all anti-virus software and firewall before installation, click on the upper computer installation package installation software, if there is a security prompt, Please click allow or agree. When the installation is complete, we double-click the rie data logger monitoring system application shortcut to open the software, as shown

SystemInfo	2019/3/29 16:52	Data Base File
unins000	2019/4/23 19:01	QQLive媒体文件(....
rie unins000	2019/4/23 19:00	应用程序
XTPCurve.ocx	2019/4/23 17:37	ActiveX 控件
XTPDigital.ocx	2019/4/23 17:37	ActiveX 控件
XTPGrid.ocx	2019/4/23 17:37	ActiveX 控件
rie 数据记录仪监控系统	2019/4/23 17:38	应用程序
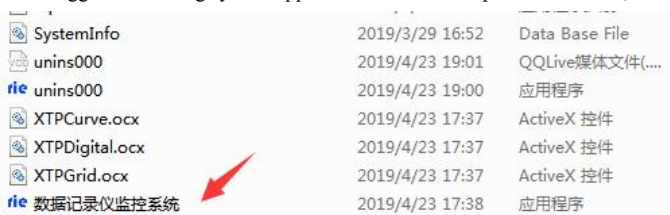
in figure 7-1.

Chart 7-1

Data recorder monitoring system

7.2 System Interface introduction double-click operation will pop up the system main interface, as shown in figure 7 / 2.
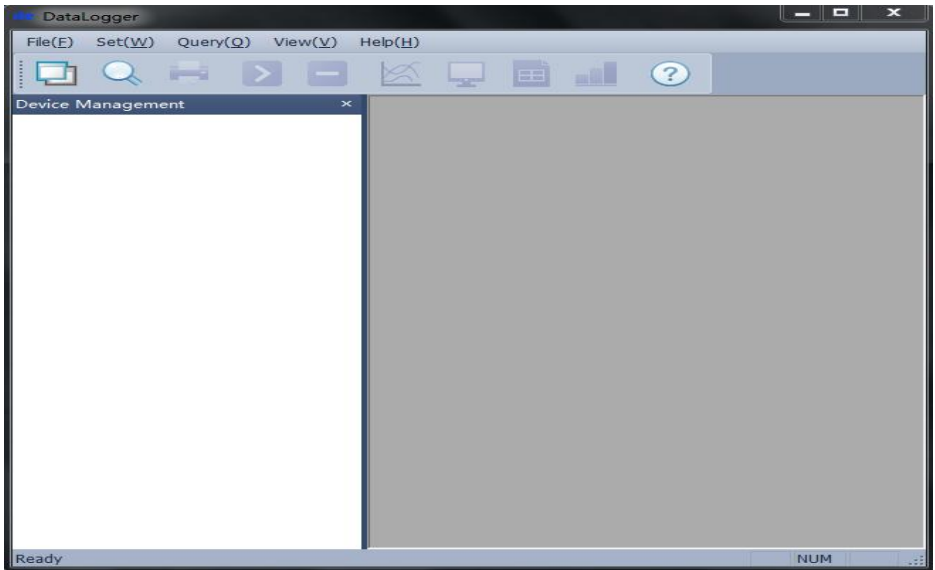
Chart 7-2 DataLoggerMain window

Documents Set up. Query. View. Help。

7.3 Set up equipment and communication settin

7.3.1 Setup equipment

Right-click in the device Management area and select add device pop-up as shown in figure 7 / 2 New device dialog box. The device name can be self-named and the device address is the logger address

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(which can be queried in the logger system setup interface). Select the appropriate number of channels and start channels as needed (the default starting channel is 1). When the number of channels is greater than 64 or the channels need to be divided into different classes, various channels can be hung on different devices. As the first 8 channels measure temperature, the last 8 channels measure humidity and want to display them in different windows, click: 1) create a new 8 Device type (select communication protocol, where * w represents wireless protocol)-> device name-> device address 1 (instrument default address is 1)-> number of channels 8 channels-> start channel 1; 2) establish a 24-channel device with a device name-> device address of 1-> number of channels 24 channels-> start channel 9. The above is the operation of different channels of the same instrument.

Device type: select TP Series logger (float)

Device name: can be filled in according to your needs or habits

Device address: if only one recorder is connected to a computer, it is set to: 1 if a computer connects two or more devices with only one serial port, each device address it establishes is filled out in order of 1,2,3.8, 9, etc.

Number of channels: fill in according to actual need

Starting Channel: typically starting from Channel 1

Chart 7-3 New device Dialog Box

New equipment. Device type. TP system logger. Device name. You can name it at will. Device address. Number of channels. 24 channels. Starting channel. The first channel.

1, system name display area: display in upper-left corner of the system
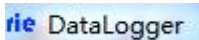
2. Main Menu Bar: Contains 5 Options: File (F), "Settings", "Query", "View (V)" and "Help (H)".

2.1 The "File (F)" option includes three operations: adding device, file conversion, and exit (X).

2.2 "Settings" option for "Alarm Settings";

2.3 "Query" option to query historical data;

2.4 The "View (V)" option can set up the display of "Device Management", "Toolbar" and "Status Bar" of the system.

2.5 "Help (H)" option to provide users with version information of the system.

3. Toolbar: 10 options including equipment management, query history, print preview, start acquisition, stop (data acquisition), curve (data curve), digital display, list, bar chart and version information.

4. Display the main window: the collected data are displayed in different ways, and the display areas such as historical data, alarm records and queries are displayed.

7.3 Set up equipment and communication settin

7.3.1 Setup equipment

Right-click in the device Management area and select add device pop-up below figure 2 / 3 New device dialog box. The device name can be self-named and the device address is the lower machine address (which can be queried in the lower computer system setup interface). Select the appropriate number of channels and start channels as needed (the default starting channel is 1). When the number of channels is greater than 64 or the channels need to be divided into different classes, various channels can be hung on different devices. If the first 8 channels measure temperature, the last 8 channels measure humidity and want to display them in different windows, click: 1) create a new 8-channel device, device type (select communication protocol, where * w represents wireless protocol)-> device name-> device address is 1 (instrument default address is 1)-> number of channels 8 channels-> start

channel 1; 2) establish a 24-channel device with a device name-> device address of 1-> number of channels 24 channels-> start channel 9. The above is the operation of different channels of the same instrument.

Chart 7 New device dialog box

The system also provides a 1-to-many communication mode, that is, the system can monitor multiple instruments at the same time. If you have more than one instrument to monitor at the same time, you can do the following: 1) set the device address to 1, 2, 3, respectively in the system setup interface of the instrument (2) the corresponding channel is set up in the system, where the device address is set to be consistent with the device address set by the instrument. If there are two instruments, the first one is set to 1 for the 16-channel device address and the second is the 32-channel device address at 2; in the system, a device is first established: device name-> device address is 1-> pass Number of channels 16 channels-> start channel 1; establish another device: device name-> device address is 2-> number of channels 32 channels-> start channel 1.

Place the mouse over the device name, here in the device management bar 1 (device name) right-click above to select device Properties, pop-up the device Properties dialog box as shown in figure 2 / 4. This can be set to communicate with the lower computer network port or serial communication, this can be set according to your needs.

Network port communication

Connect the lower computer with the computer with a network cable, view or modify the ip address in the setup interface of the lower computer system (the 7-inch instrument does not have the network port, that is, it does not support the communication mode), and then modify the local connection address of the computer. Make sure the computer and the lower computer ip are in the same network segment. The port number defaults to 3000.

Serial communication

In addition to the above-mentioned network port communication, the instrument also supports serial communication. The port can be selected by the RS232 of the computer and the RS232 port of the instrument. The port can be selected by clicking the drop-down box. The baud rate is 9600.

The mobile phone number refers to the tel number in the interface of the lower computer system. The purpose is to provide the short message alarm function for the user (this function requires the addition of the short message alarm module). Click OK to save the settings and close the dialog box.

Chart 7 device Properties Setting

Set properties. Setting, setting the name. Device type. Equipment ID. Device type. Save interval, start channel. Acquisition interval. Time to drop the line. Network port communication. Serial

communication. IP address, port. Port. Approval rating. phone number。 Read. Write. Historical data.
Limit network port communication. Start time. End time. Read. It has stopped. Yes. cancel。

7.3.2 Select data display

This system provides a variety of data display methods: curve, digital display, list and bar chart.
When you double-click device 1, you can select how the toolbar displays (by default, the curve interface
is shown in figure 7 / 5 below), and when the parameters are set, In the main menu bar, the "real-time
capture" option or directly in the toolbar to select a data display mode, here only select the digital
display mode to explain. In the main menu bar, select start Real-time capture in actions or click the start
capture button in the toolbar to start communication with the lower computer, as shown in figure 7 / 5.

In the curve interface, right-click in the curve drawing area to select the parameter settings shown
in figure 7 / 6 below to set the curve properties. Four different Y axes can be set in this window, and
different channels can be selected and the corresponding curves can be drawn. But only one Y axis can
be selected for a channel. The curve properties of each channel can be set by clicking the appropriate
channel within the device management area.

Hold down the shift key and select the appropriate area on the curve to calculate the maximum,
minimum, and average values of each channel during this period of time. Hold down the Ctrl key and
select the appropriate area to zoom in on this curve along the X axis.
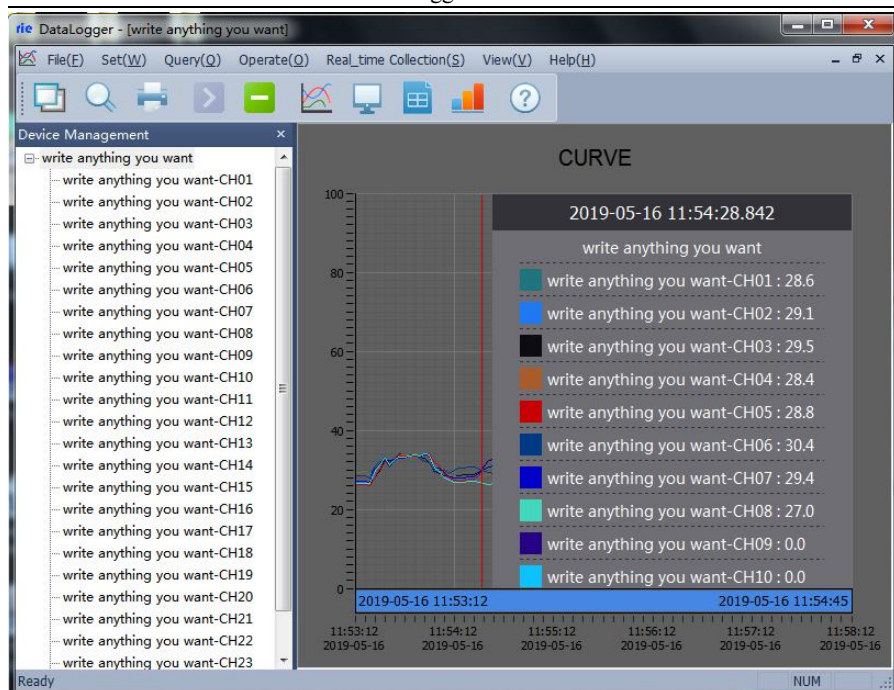
Chart7-6 Curve interface

曲线 curve

Documents Set up. Query. Operation. Real-time collection. View. Help。

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Curve settings. Curve. Wired. Curve name. Hide. No。 Aisle。 Name. Units. Color. Hide. Decimal. Y axis. Yes. cancel。
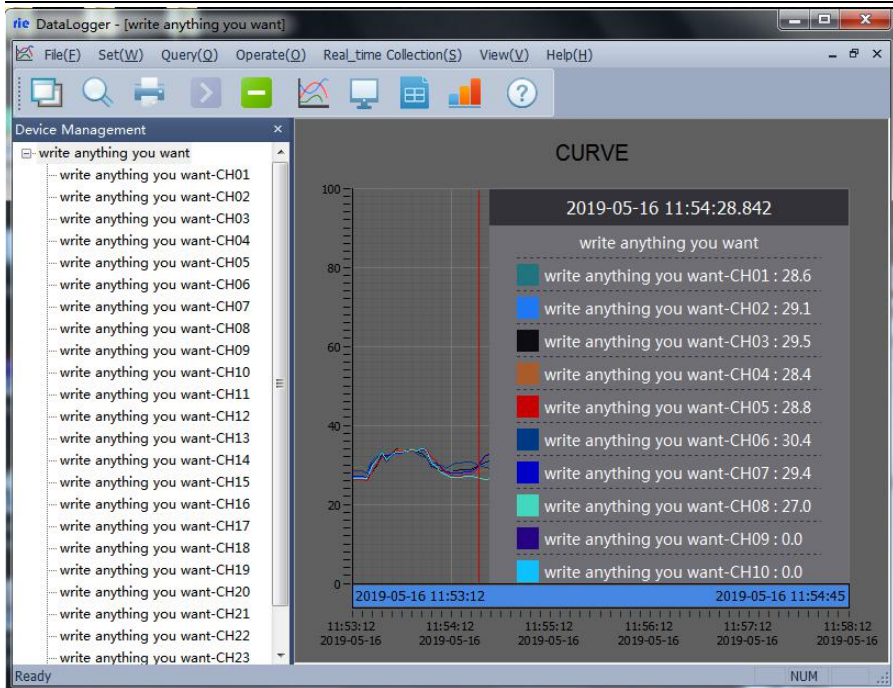
Chart7-8　　Draw multiple Y axis

Documents Set up. Query. Operation. Real-time collection. View. Help。

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Chart7-9 Shortcut key average

Documents Set up. Query. Operation. Real-time collection. View. Help。

Chart7-10   Digital display interface

Documents Set up. Query. Operation. Real-time collection. View. Help。

Chart7-11List Interface

Documents Set up. Query. Operation. Real-time collection. View. Help。

Data logger manual
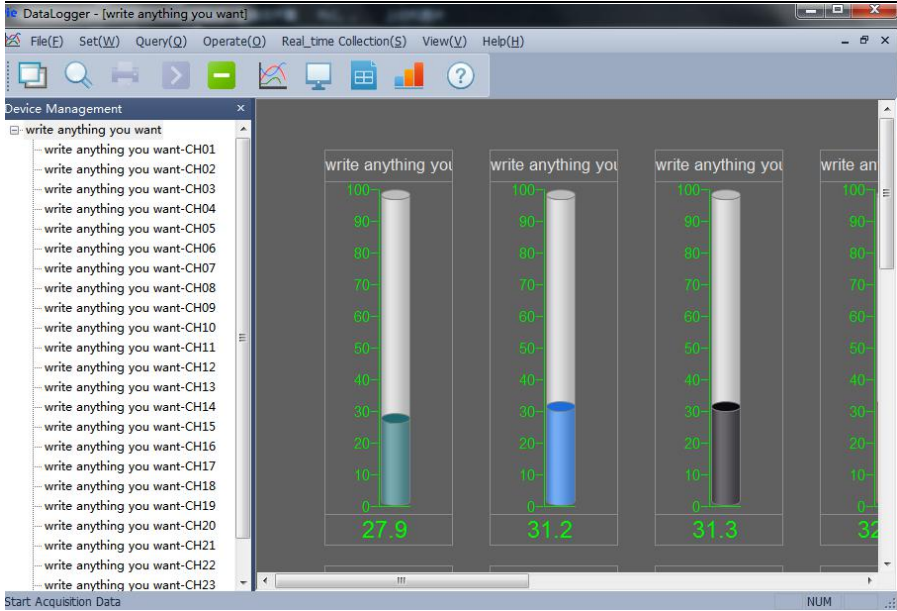
Chart7-12 bar interface

Documents Set up. Query. Operation. Real-time collection. View. Help。

Each channel parameters can be set in the device management area, select the appropriate channel right-click device properties. The following Chart7-13 channel property settings can be set in this window: Channel name, no alarm: yes / no, display color, channel units, display decimal, etc. And can read to the lower computer is the instrument equipment to take or write the lower and upper limit of the channel and so on operation.

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Chart7-13 Channel Properties Setting

Channel properties. Property. Device name, wired. Channels, no, color, units, decimal places, upper and lower limits, read, write, confirm, cancel.

7.3.3 Alarm setting

This system provides intelligent short message alarm service for users, this service needs to connect external short message alarm equipment (the computer end needs external wireless message alarm device, such as T3-DTU equipment, the next Chart7-14 shows, The alarm device described below refers to the T3-DTU device), the function is to change the device to send SMS messages to the administrator by SMS, management should be based on the content of this text message is not sure whether to go to the scene or not. Specific setting method: select the "set" option in the main menu bar, select "alarm Settings" to enter the "alarm Settings" interface, as shown in the following

Chart7-15.
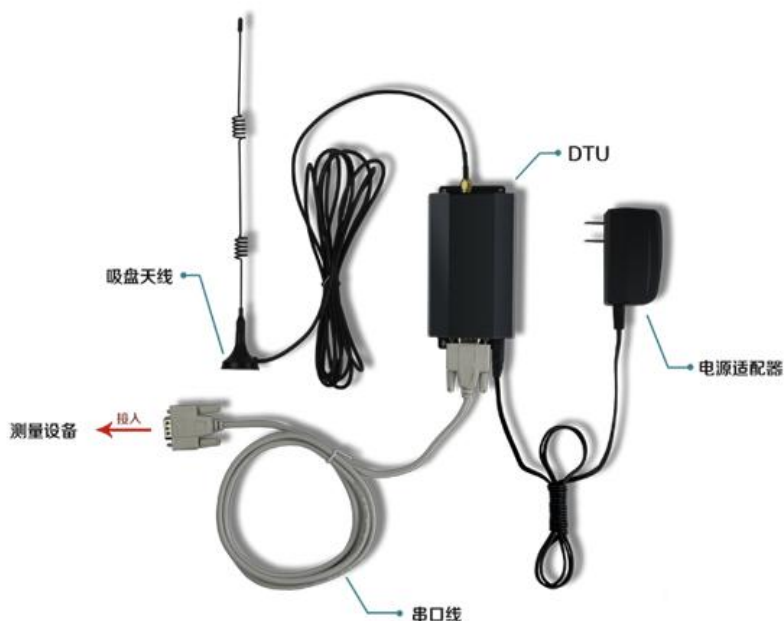
Chart7-14 DTU- Wireless SMS Alert

Port number: com3 is the serial port used by SMS alarm (according to the connection port of SMS alarm identified by the user host, the user chooses).

Baud rate: default is 9600 (depending on the alarm device communication bit rate), then set port number and baud rate need to stop data acquisition.
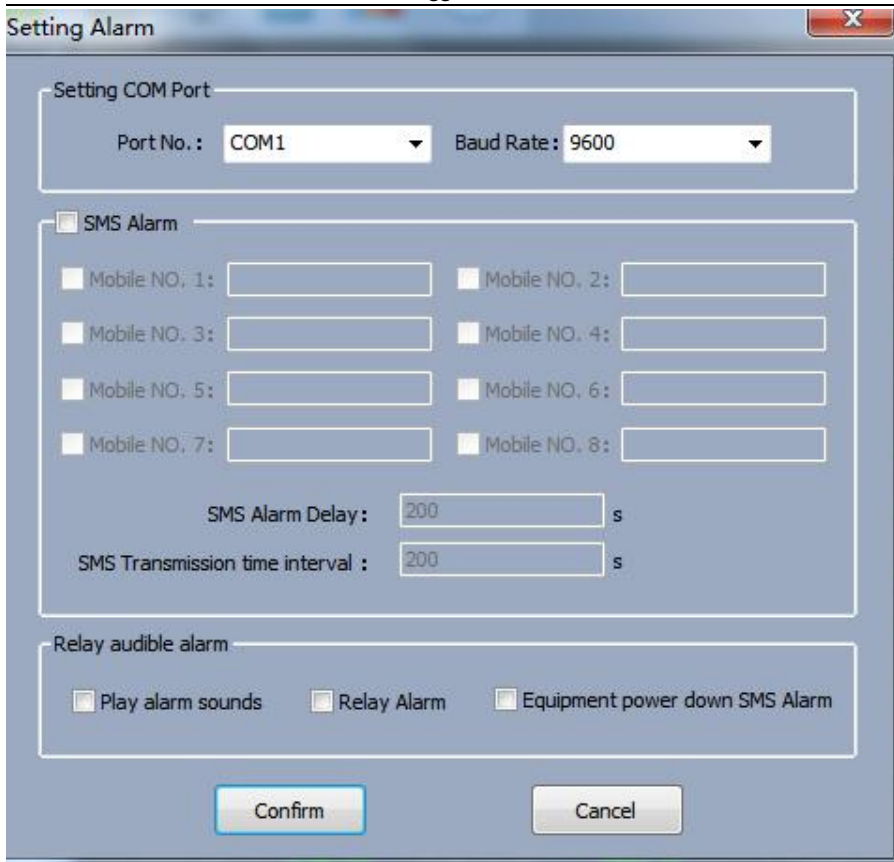
SMS alarm: eight mobile phone numbers can be associated at the same time (note: only mobile phone cards can be used at present). When the temperature or humidity exceeds the upper limit or below the lower limit, the SMS alarm will automatically send text messages to the associated mobile phone numbers.

Sound alarm: the alarm sound is played, when the alarm trigger condition is reached, the system will issue an alarm sound.

SMS alarm delay: when the alarm condition is triggered, choose how long the delay time to send the alarm message to the administrator.

Short message sending time interval: set alarm message sending period.

The right side of the alarm setting interface can read or write to the upper and lower limits of each channel of the device, and the upper and lower limits are mainly for alarm service, that is, when the data collected by the channel is greater than the upper limit of the channel or less than the lower limit of the channel, The system will send an alarm message to the administrator through an external alarm device.

Chart7-15　Alarm setting

Alarm settings. Port settings. Port number. Baud rate, SMS alarm, cell phone number. SMS alarm delay. SMS send alarm interval. Relay sound alarm. Broadcast alarm sound, relay alarm, equipment drop short message alarm, confirm, cancel.

。Click Save to return to the main system interface, as shown in Chart7-16. At this point in the digital

display window you can see that the third channel data exceeds the upper limit set by the system (both data and upper limit values are shown in red) and the system sends information to the administrator's phone every 20s.
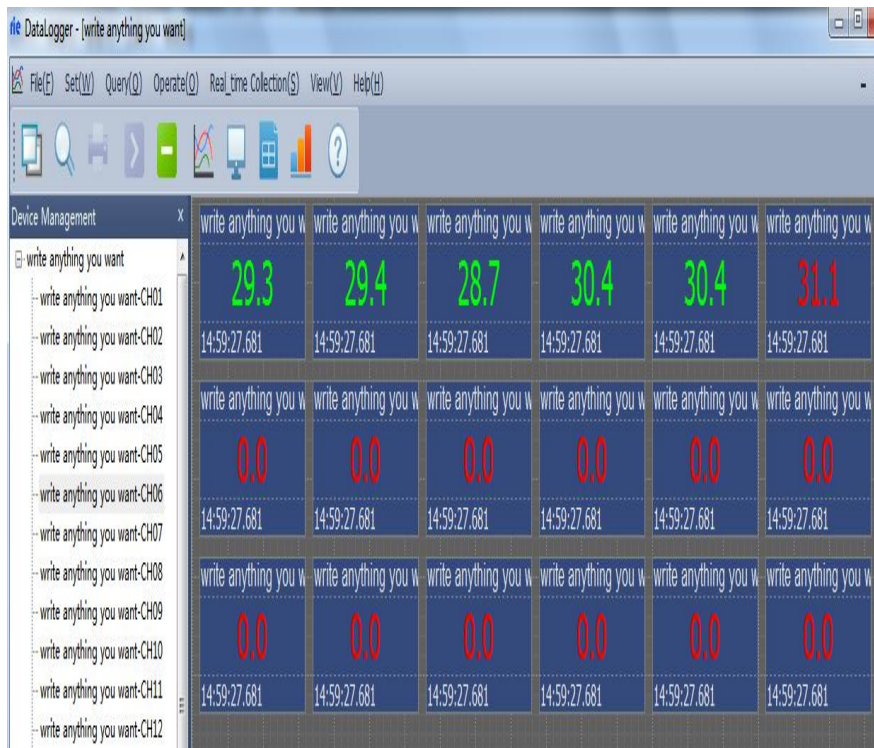
Chart7-16　　Data exceed upper limit alarm

Documents Set up. Query. Operation. Real-time collection. View. Help。

7.4.1　Historical data and alarm record query Export

Click "Historical data" in the "query" option in the main menu bar, pop-up the Chart7-17 interface,

select the data you need to query in the interface, and then select the appropriate action in the selection: open the history curve, open the history list.

Chart7-17　history

Click "alarm record" in the "query" option in the main menu bar to pop up the Chart7-18 interface, where you select the data you need to query.

Chart7-18　Alarm record

Click the Export button pop-up dialog box, select the appropriate path and file name, and then click Export, the data saved in the software will be saved to the file.

7.4.2 Turn on the history data exported by the lower machine

The software supports the ability to read the data exported by the lower computer. Clicking on the slave computer to quickly export the data will generate a "data" folder in the root directory of the U disk. Click on the file in the menu bar in the software to select "File conversion" pop-up of the following 7 / 19 dialog box, select the appropriate start time and end time, select the MCGS_DATA file in the U disk, the export path depending on your own situation. Then click Export.
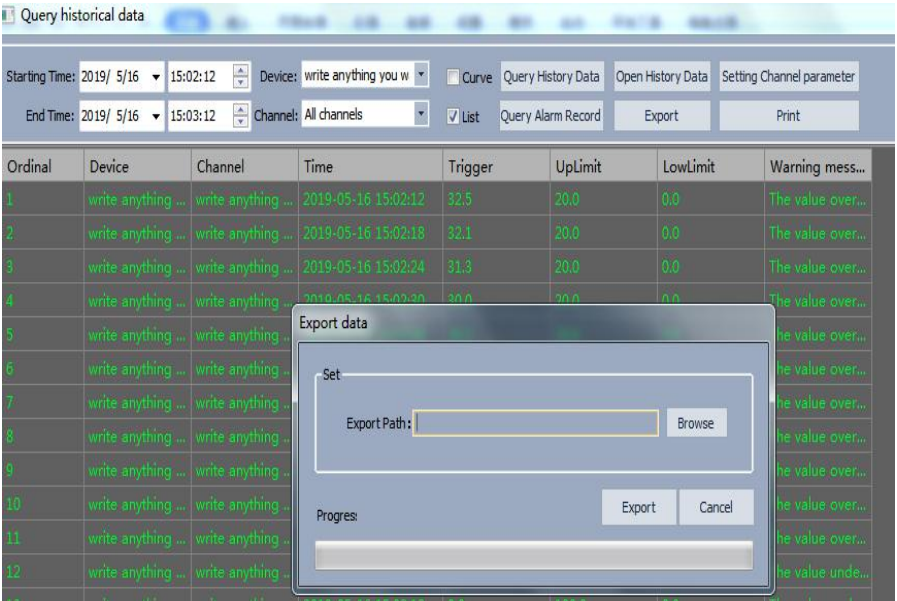
Chart7-19 File conversion dialog box

Export data, time, start time, end time, path, File path, Export path, Browse, Export, status, ready.

Then enter the query historical data query interface, click "Open Historical data" to select the

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converted file, click Open "Open Historical data" and click Browse to find the folder where the recorder downloaded and transferred. The file name extension * .csv, you can find the logger to download the transferred file (such as Chart7-20), click Open, you can select list view and curve view during the opening process. And in the lower computer directly click export data, it does not need a file, directly into the historical data query.
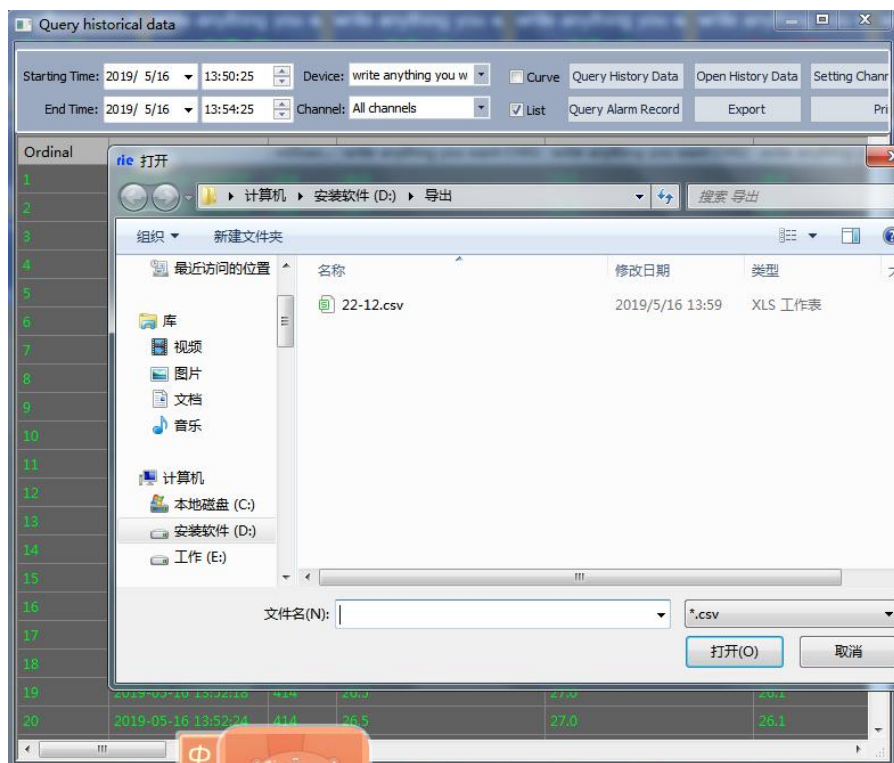

Chart7-20 Open the data downloaded by the logger

Documents Set up. Query. Operation. Real-time collection. View. Help。

View historical data, start time, end time, device, path, curve, list, view historical data, open history value, shut down parameter settings, query alert record, serial number, time, milliseconds, path, maximum, minimum, Average, Open Historical data, Settings, File path, Browse, Progress, Click Open

Historical data, Click Browse, Open, Music, HomeGroup, computer, Local disk, choose the file with the CSV extension, Download the de file from the logger and click Open.

View historical data, start time, end time, settings, paths, curves, lists, query historical data, query alarm records, open historical data, export, path parameter settings, print, serial number, path.
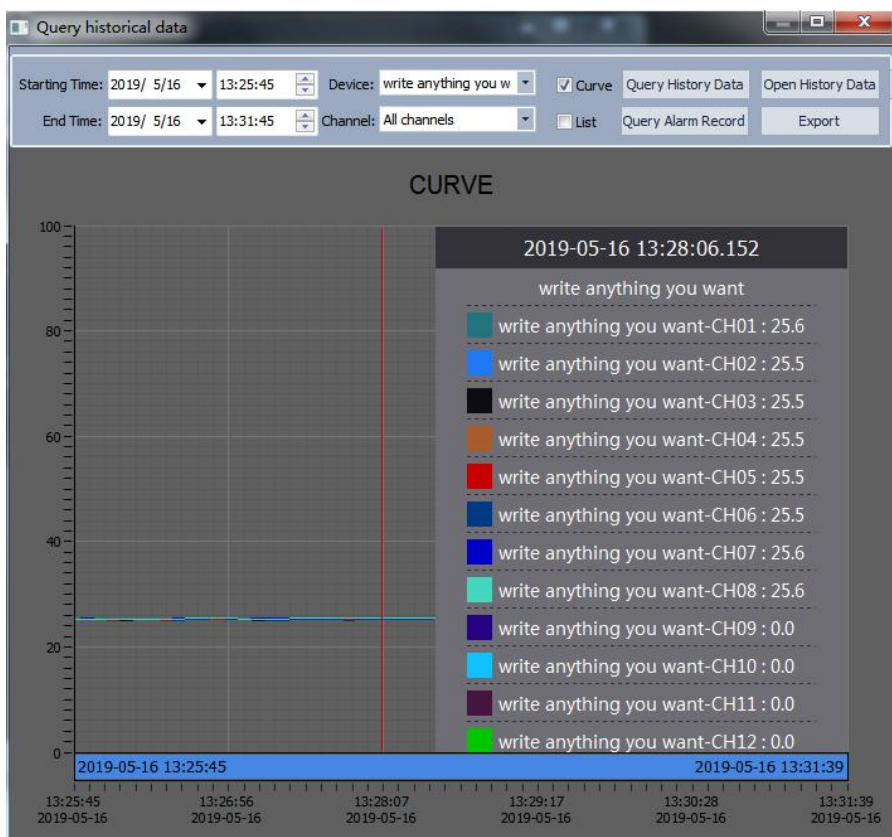
Chart7-22Open History data Curve Browse

View historical data, start time, end time, settings, paths, curves, lists, query historical data, query alarm records, open historical data, export, path parameter settings, print, serial number, path.
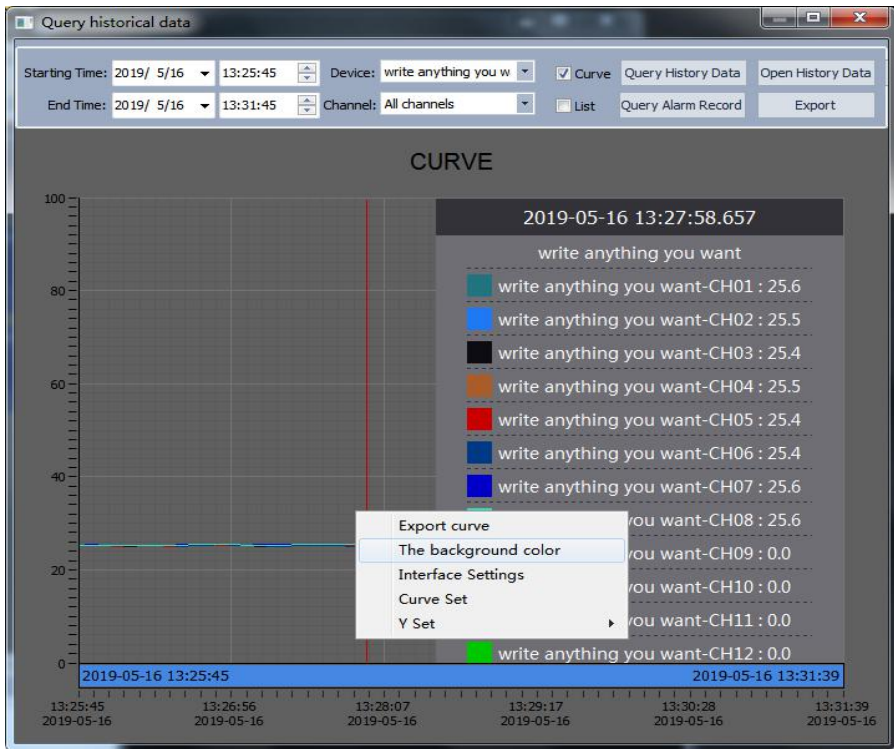
Chart7-23 Right mouse button

View historical data, start time, end time, settings, paths, curves, lists, query historical data, query alarm records, open historical data, export, path parameter settings, print, serial number, path.

Curve. Export curves, background colors, interface settings, curve settings, Y-axis settings,

Right-click to export curve Chart save, background color can be set as followsChart7-24。
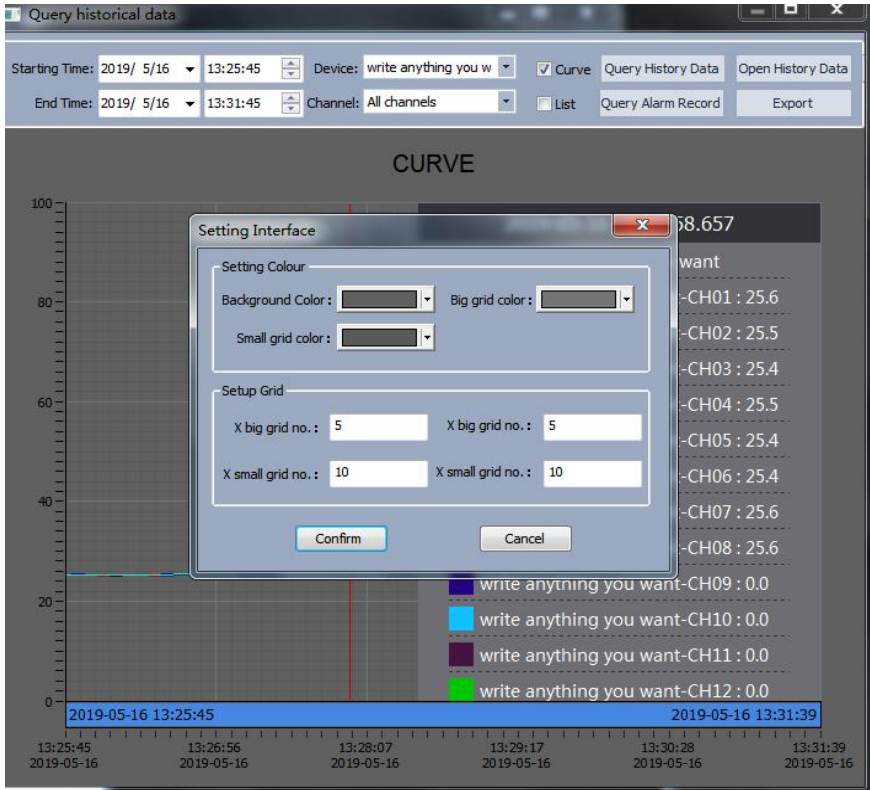
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Chart7-24

View historical data, start time, end time, settings, paths, curves, lists, query historical data, query alarm records, open historical data, export, path parameter settings, print, serial number, path.

Interface settings, color settings, background color, large bold grid color. Small bold grid color, grid color setting, X axis large coarse grid color, X axis small coarse grid color, X axis large coarse grid number, X axis small coarse grid number, OK, cancel,

Chart7-25

View historical data, start time, end time, settings, paths, curves, lists, query historical data, query alarm records, open historical data, export, path parameter settings, print, serial number, path.

Curve settings, curve name, hide, path, name, unit, color, hide, decimal, y axis, Yes, cancel

Curve settings such as Chart7-25 first select the curve name, then under the curve name of each channel

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name can be self-named, and then for each curve, units, colors, whether to hide, The number of decimal bits displayed and the corresponding number of Y axes are selected; The selection of Y axis can set the range of up and down display of Y axis by itself, and the corresponding Y axis can be selected for the value of different measurement range. For example, if we test that value of AC voltage, we can select the Y2 axis of the range corresponding to 0? 300V, and for the maximum temperature that we can measure to 1200 ℃, we can choose the range of 0? 120? 0 ℃ Y1 axis, move the mouse to the corresponding Y axis point right-select the Y axis name, color, up and down range settings such as Chart7-26.
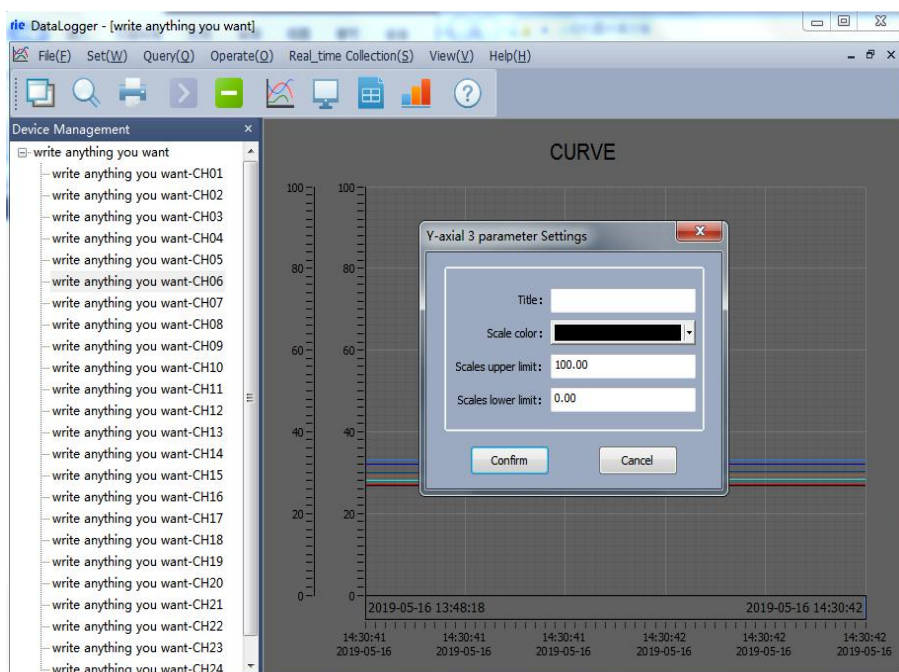

Chart7-26

Documents Set up. Query. Operation. Real-time collection. View. Help。

Y axis parameter settings, name, scale color, scale upper limit, scale lower limit, OK, cancel,

7.4.3 Historical data printing

Print Historical data method: back in the Chart7-17 interface, you can choose the print curve and print list two modes, first select the data to export, click the "Open History Curve" button, select the curve print option, enter the 7x27 interface. Select a curve and click print.
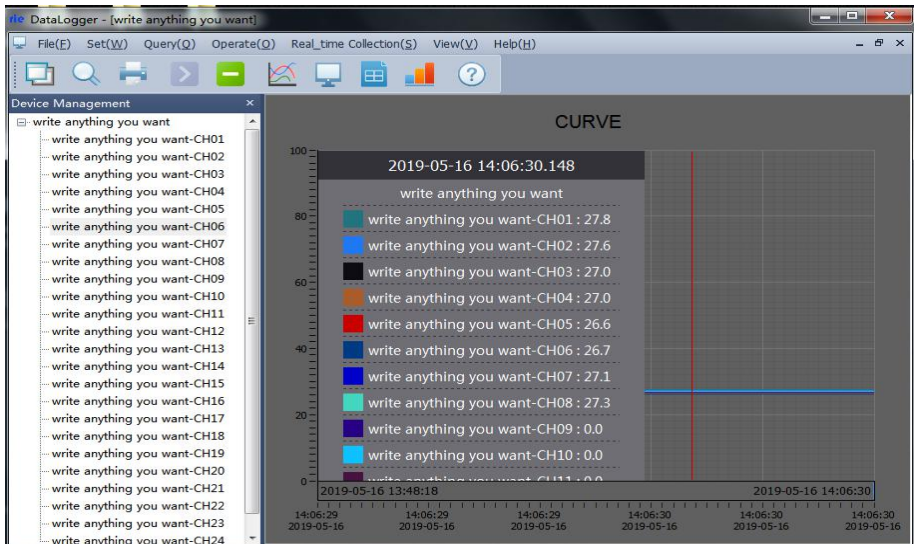

Chart7-27   print preview

7.5 System exit

Method 1: click on the upper right corner of the system The word "×" in

Method 2: point the file (F) option in the main menu bar of the system, and select exit (×) as
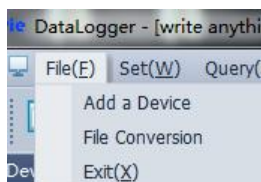
shown in Chart7-28.

Chart7-28 System exit

Add devices, file conversion, exit, settings.