User's
Manual

User's
Manual

FOREWORD

Thank you for purchasing our paperless recorder!

This manual is about the functions, settings, wiring methods, methods of operation, failure of treatment methods of the paperless recorder. To ensure correct use, please read this manual carefully and use properly before operation and keep this manual in a safe place for quick reference.

Notice

● The contents of this manual are subject to change without prior notice as a result of continuing upgrades to the instrument's performance and functions.

● Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, if you have any questions or find any errors, please feel free to contact us.

● Copying or reproducing all or any part of the contents of this manual without our permission is strictly prohibited.

Revisions

First edition   Feb. 2023,   IMR8-EZ01g

SAFETY PRECAUTIONS

For your safe use of this instrument be sure to comply with the following safety precautions. If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired. We assume no responsibility for the customer's failure to comply with these requirements.

WARNING

- Power Supply

Before connecting the power cord, ensure that the power supply voltage matches the voltage rating for the instrument.

- Protective Grounding

Make sure to connect the protective grounding to prevent electric shock before turning on the power.

- Necessity of Protective Grounding

Never cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Otherwise, it will pose a potential shock hazard.

- Defect-Free Protection

Do not operate the instrument when the protective grounding might be defective. Also, make sure to check them before operation.

- Do Not Operate in Explosive Atmosphere

Do not operate the instrument in the presence of flammable, explosive gas or vapors. In such circumstances the use of this instrument is very dangerous.

- Do Not Remove Covers

Please do not tear down part of the front screws and open the front panel, because some areas inside the instrument have high voltages .The cover should be removed by our qualified personnel only.

- External Connection

Connect the protective grounding before connecting to the items under measurement or external control circuit connections.

- Damage to the protection

Using the instrument in a manner not specified in this manual can damage the instrument's protection.

CHECKING THE CONTENTS OF THE PACKAGE

Unpack the wrapping box and check the contents before operating the instrument. If some of the contents are not correct or missing or if there is any physical damage, contact our company or the sales network from which you purchased it.
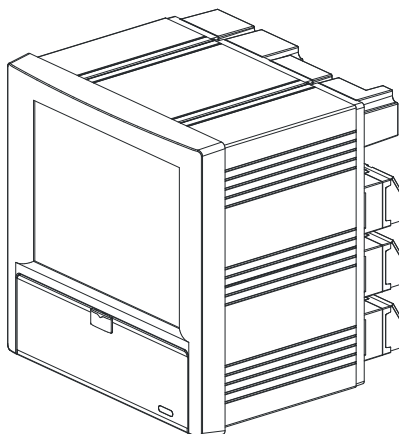
Accessories

The following accessories are supplied with the instrument. Make sure that all items are present and undamaged.
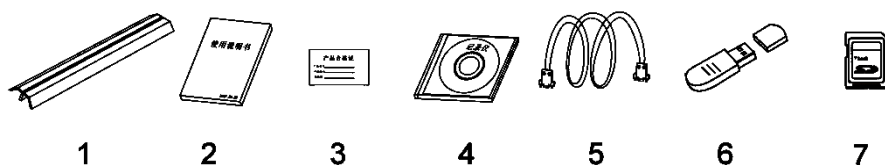
Number	Name	Quantity	Notes
1	Mounting bracket	2	For panel mounting
2	User's Manual	1	Ordered
3	Certification	1	Manufacture Date
4	Standard Software	1	Ordered
5	Communication Cord	1	1.5m(Included only when the Communication interface is RS232.)
6	U Disk	1	Included only when the external storage is ordered. Capacity and model of the USB storage may vary, max：32GB.
7	SD card	1	Included only when the SD card storage is ordered. Capacity and model of the storage may vary, max:32GB.

Accessories (Sold Separately)

The following optional accessories are available for purchase separately. When ordering, make sure whether there is a shortage or damage. For information about ordering accessories, please contact us.

Number	Name	Quantity	Notes
1	U Disk	1	Max:32GB
2	SD Card	1	Max:32GB

Symbols Used in this Manual
Unit
K   Denotes"1024"
k   Denotes"1000"
M   Denotes"1024K"
G   Denotes"1024M"
B   "Bytes"

Symbols (The following symbols are used in this manual)
WARNING: precautions that should be observed to prevent injury or death to the user.

CAUTION: precautions that should be observed to prevent damage to the instrument.

Note   :   Providing important information for the proper operation of the instrument.

Operation of Marks
The following symbols are used during the explanation of operation
[ ] : represents key's name. Example: [Page] [En]
 『 』 : represents a reference item. Example: 『Input Channel』
 【 】 : indicates screen element .Example: 【Device Name】

Content

CHAPTER 1 OVERVIEW OF THE FUNCTIONS

1.1 overview of the instrument

Unlike conventional record that record data on charts, the Instrument displays the measured data in a LCD. Moreover, the measured data can also be saved to external storage media such as U Disk (additional specifications).
Measured/ operational data can be used as displayed data stored in the memory, or you can also insert the external storage to save it in the external storage media through automatic or manual backup.
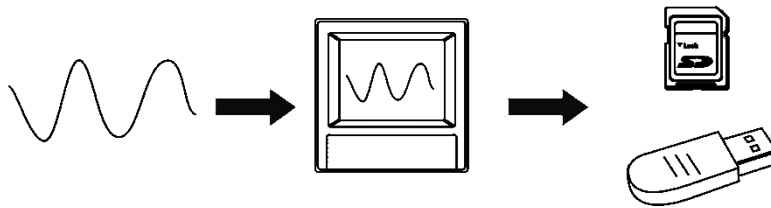
Displayed data is shown as curves and other data on meter screen. It is the data filter out from the samples by the instrument. A datum is equivalent to a point on the curve of the screen. The time of a datum is determined by recorded meter intervals. Historical data is equivalent to the original recording paper, which is very suitable for long-time observation.

1.2 functions of the input section

Number of Measurement Channels/Scan Interval

The number of measurement channels can be selected from 1~48.
The scan interval of measurement is 1 second.

Input Type and Computation

You can select the input type of a measurement channel as follows. You can also perform computation for instance, the "square root," on the measured data. For the procedure related to setting the different modes, see section 『System Configurations』

Input Mode	Signal Type
DC current	0-20mA，4-20mA，0-10mA
DC voltage	0-5V，1-5V，0-10V，20mV，100mV
Resistance	400Ω,175Ω
frequency	Fr
RTC	PT100，PT100.，Cu50，Cu53，BA1，BA2
Thermocouple	S，R，B，K，N，E，J，T，WRE5-26，WRE3-25，F1，F2
General vacuum	20mA，5V，10V
Section vacuum	20mA，5V，10V
Digital	Voltage，Switch

Input Range and Measurable Range

You can select the "Input range" that is appropriate for the input signal in "DC current," "DC voltage," "Resistance," "Thermocouple" "Thermal Resistance," "Frequency signal".

For each "Input range," a measurable range is defined.

Input type name	Resistance (°C)						Thermocouple (°C)												0~20mA 20mV/100mV resistance：400Ω/175Ω frenquency：0 ~ 10KHz II type：0 ~ 10mA / 0 ~ 5V III type：4 ~ 20mA / 1 ~ 5V
	Cu50	Cu53	Pt100	Pt100.	BA1	BA2	WRE3-25	WRE5-26	F1	F2	S	R	B	K	N	E	J	T	
upper	150	150	650	150	650	650	2310	2310	2000	2000	1768	1768	1820	1372	1300	1000	1200	400	range:- 9999~30000
lower	−50	−50	−200	−50	−200	−200	0	0	700	700	−50	−50	250	−200	−200	−200	−210	−200	
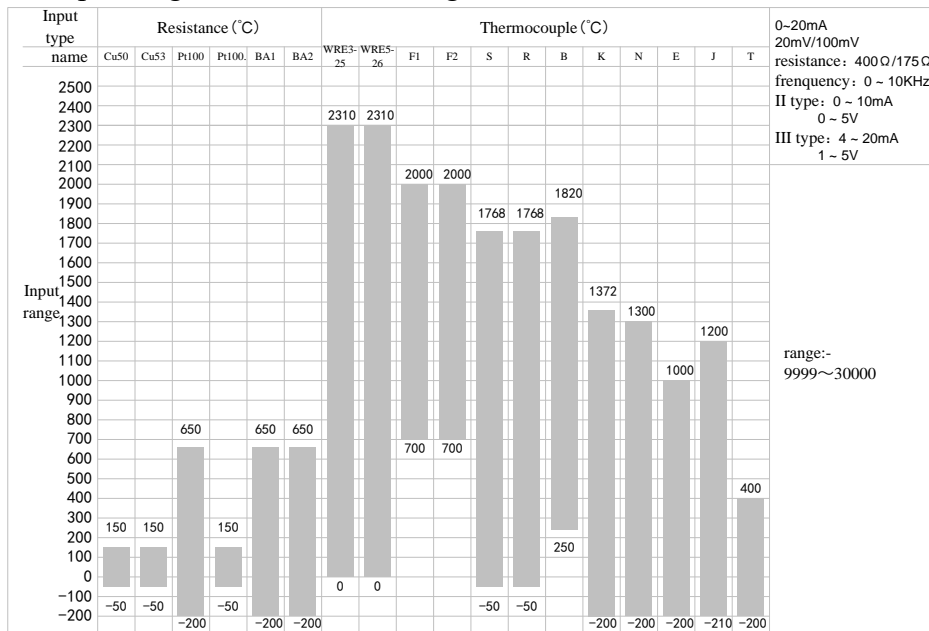
Burnout

When measuring temperature with a thermocouple / thermal resistence /4-20mA/1-5V signal, the instrument provides check burnout function. You can specify the measurement result to be set to maximum of measurable range, minimum of measurable range, last value or Error Flag*1. For the setting procedure, see section 『Burnout』

*1 when the burnout setting is Error Flag, the measured value is indicated as "-.--".

Reference Junction Compensation (RJC)

When measuring the temperature using a thermocouple, the reference junction compensation can be used. Reference junction compensation current is installed. You can adjust the temperature that measured by the instrument. For the setting procedure, see section "reference junction compensation".

Filter

The filter is used to suppress the disturbance that is curbing the signal. Filtering is provided by the standard products. The filter can be set on each channel. For the setting procedure, see section 『set filter parameter』.

1.3 display function

Common items related to the display
TFT Color LCD and the Screen Configuration

The instrument has a 10.4 TFT color LCD (800-by-600 dot resolution).
The screen consists of the status display section and the data display section.
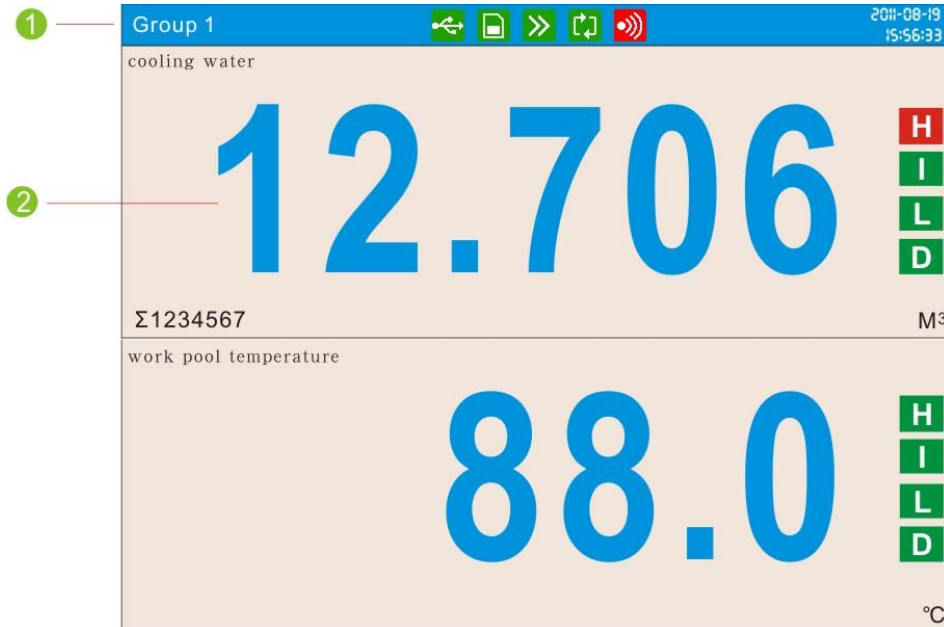
1. Status Display Section
Display the screen name, date and time, input acquisition board status, relay output status, USB devices connection (additional specifications), cycle display signs, searching status. For details, see section 〖status display〗.

2. Data Display Section
Display the operation screen such as the digital display, bar graph display and trend display alarm, print, backup, etc.
When it has function configuration, display configuration mode.

Group Display
The data displayed on the curve displays are the data of measurement or computation channels that are assigned to the group. Up to 8 channels can be assigned to a single group. For the procedure used to assign channels to groups, see section 〖configuration display 〗.
Up to 8 sets of combinations can be used in the digital screen, bar graph screen, real-time curve screen and historical curve screen effectively.

Run Mode

This mode is entered when the power is turned on.

Display various operation screens such as signal's digital, alarm status, trend, historical trend, alarm summary, data print (option), and data backup display (option).

Running condition is under a number of remarkable figure images, digital display screen, bar graph screen, real-time curve of the screen, and historical curve of the screen and function screen. Function screen includes the alarm list screen, data print screen (additional specifications), backup historical data (additional specifications), the accumulative report (additional specifications), power-down recording and system logs and other screens.

Configuration screen

This instrument is in Configuration mode to set various functions.

Under Configuration mode, this screen is used to set system configuration, recording configuration, input configuration, output configuration, alarm configuration, display configuration, report configuration, print the configuration and communication configuration parameters.

1.4 storage function

The instrument can save measured data and computed data, which are first acquired to the instrument's internal memory as display data. Then, the data are saved to the external storage medium on paper. For detail, see sections 〖data backup 〗 and 〖recording configuration〗 .

External Storage Media
U disk, max: 32GB
Normal SD card, max: 32GB

Measurement period and recording intervals
AD sampling period is 120 milliseconds, which is an integer multiple of 50Hz power period. This can effectively eliminate the interference of power frequency. The measurement interval of signal is fixed at 1s. The measuring and computing are completed in every scan interval. Display data is generated by these data.
Recording Interval is used by the instrument to record the time interval of data which is saved to the internal memory.

Saving Data to Internal Memory
The display data are saved to internal memory continuously according to the recording interval while the instrument is on.
If the instrument is unplugged, it will automatically generate a new history data file when the power is turned ON.

Saving Data to External Storage Media
Automatic Backup: after inserting The SD card into the drive, the instrument automatically back up the historical data to SD card every day from 0:00 ,even when the instrument stops recording or it reaches the trigger condition that the users set. For trigger condition setting and operation, please refer to 〖Recording configuration seeting〗
Manual Backup: enter the screen "data backup", and then you can back up internal data to USB or SD cards.

1.5 alarm function

Real-time data alarm can be set or alarm relay output (additional specifications). For details, see section 『Setting Alarms』.

Number of Alarms

You can set up to four alarms for each channel.
- High alarm (H)

An alarm occurs when the measured value is greater than or equal to the alarm value.
- Low alarm (L)

An alarm occurs when the Measured value is less than or equal to the alarm value.
- Incremental alarm (I)

An alarm occurs when increased measured value of the time point is greater than or equal to the value of alarm value.
- Reduction alarm (D)

An alarm occurs when reduced measured value of the time point is greater than or equal to alarm value.

Alarm Accessibility

Use the following auxiliary functions

Functional	Content
Transfinite alarm Hysteresis	Set any hysteresis within the range
Incremental Alarm Time	Setting the length of incremental alarm time
Reduced alarm time	Setting the length of reduced alarm time
Alarm relay output (additional specifications)	When alarm occurs, output contacts signal

Alarm display

Show alarm state in the digital display screen, bar screen and real-time curves of screen, and display the icon of output relay in the System Column.

1.6 report functions (additonal specifications)

The Accumulation computation and reports can be performed, but the monthly cumulative maximum value is no more than 999,999,999, otherwise the report is invalid.

Accumulation Computation
The accumulation computation is performed every second.
The accumulation computation can be performed on each measurement channel.
For detail, see section 『Report Setting』

Report function
Based on total accumulated data to show generated shift reports, hourly reports, daily and monthly reports and to keep the data up to 410 days.
● Class report: According to the number of class and time settings to show the cumulative amount of each shift.
● Horly report: Show the cumulative amount generated per hour.
● Daily report: Shows the cumulative amount generated every day.
● Monthly report: Shows the cumulative amount generated per month.

1.7 output functions (additional specifications)

Measured and Computed data can be transmitted and output as an analog signal.

Transmitter Output

The signal type of transmitter output is 4-20mA.

The instrument provides 8 channels transmitter output.

The maximum load of each channel is 750Ω.

For detail, see section 『 Output Configuration Setting』

1.8 communication functions (additional functions)

The instrument can communicated with PC via serial cable（RS232C/RS485） .
And also can print data by micro printer.

RS232C/RS485 Communications
RS232C or RS485 can be select when the instrument communicates with PC.
By using the wired network (485 networks), radio, GPRS, Modem and other methods,
connect to the computer.
The Instrument adopts the international common standards: Modbus-RTU
communication protocol.
The OPC software also provides for users, you can use it to connect the he
configuration software.

Ethernet
RJ45 can be select when the instrument communicates with PC.
By using the Modbus/TCP protocol.

Connect to the panel printer
The instrument can be connected to the panel printer.
You can print history data and history curve manually.
Print real-time data can be automatic or manual.

1.9 other functions

24 VDC Power Supply for Transmitter (Option)

The instrument provides 6 channels power supply of 24 VDC. The maximum current of each channel can be provided is 60mA.

This instrument supports 2-wire 4-20mA current input. For the wiring method, please refer to 『24VDC Power Supply for Transmitter』

CHAPTER 2 INSTALLATION AND WIRING

2.1 instrument site

Installation location
Install the instrument in a location that meets the following conditions.
● Instrument panel
The instrument is designed for panel mounting.
● Location of installation
To prevent rain and direct heat, install the instrument indoors.
● Well-ventilated location
To prevent overheating, install the instrument in a well-ventilated location.
● Minimum mechanical vibrations
Choose an installation location with the minimum mechanical vibration.
● Horizontal
Install the instrument horizontally (However, the instrument can be inclined up to 30 degrees backwards for panel mounting).

Note
● Condensation may occur if the instrument is moved to another place where both the ambient temperature and humidity are higher, or if the temperature changes rapidly. In addition, measurement errors will result when using thermocouples. In this case, let the instrument adjust to the new environment for at least one hour before using the instrument. ● The lifetime of the LCD may be shortened (lower picture quality, etc.) if the instrument is used in a high-temperature environment over a long period of time. When installing the instrument in a high-temperature environment (greater than 40°C), please don not do it.

Do not install the instrument in the following places:
● In direct sunlight or near heat sources
Install the instrument in a place with small temperature fluctuations near room temperature (25.C). Placing the instrument in direct sunlight or near heat sources can cause adverse effects on the internal circuitry.
● Where an excessive amount of soot, steam, moisture, dust, or corrosive gases are present
Soot, steam, moisture, dust, and corrosive gases will adversely affect the instrument. Avoid such locations.
● Near strong magnetic field sources
Do not bring magnets or instruments that produce electromagnetic fields close to the instrument. Operating the instrument in strong magnetic fields can cause errors in the measurements.
● Bad angle for viewing the screen
Because the instrument uses a TFT color LCD, it is difficult to view the display from an extreme angle. Please install the instrument so that the monitor can be viewed from the front.

2.2 installing the instrument

| Warning |
| --- |
| ● In order to prevent electric shock, be sure to turn off the power before the installation. |

Installation Procedure

The instrument should be mounted on a steel panel of thickness 1 mm to 10 mm.

1. Insert the instrument from the front side of the panel.

2. As shown in the figure below, mount the instrument to the panel using the mounting brackets that came with the package.

●Use two brackets under the cover of the instrument

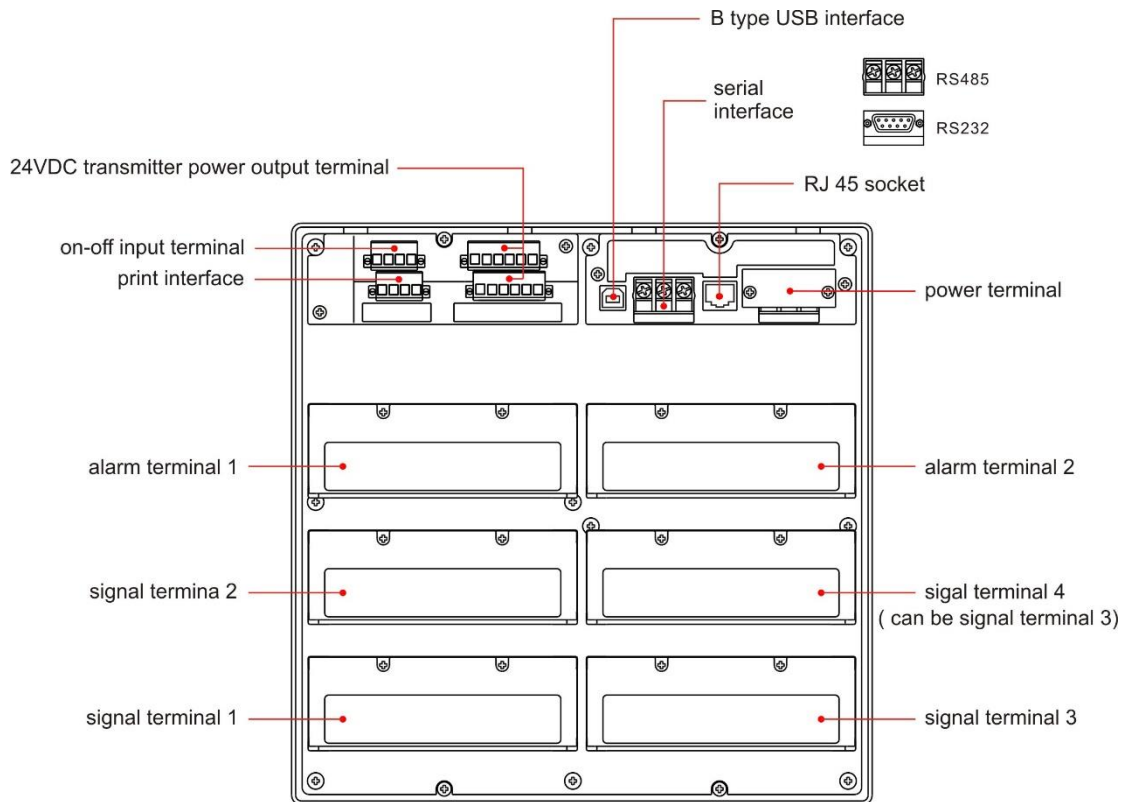●The screws of instrument panel mounting bracket are the standard M4 screws.

Installation diagram

Positioning

panle

mounting bracket

screw

front panel

mounting bracket
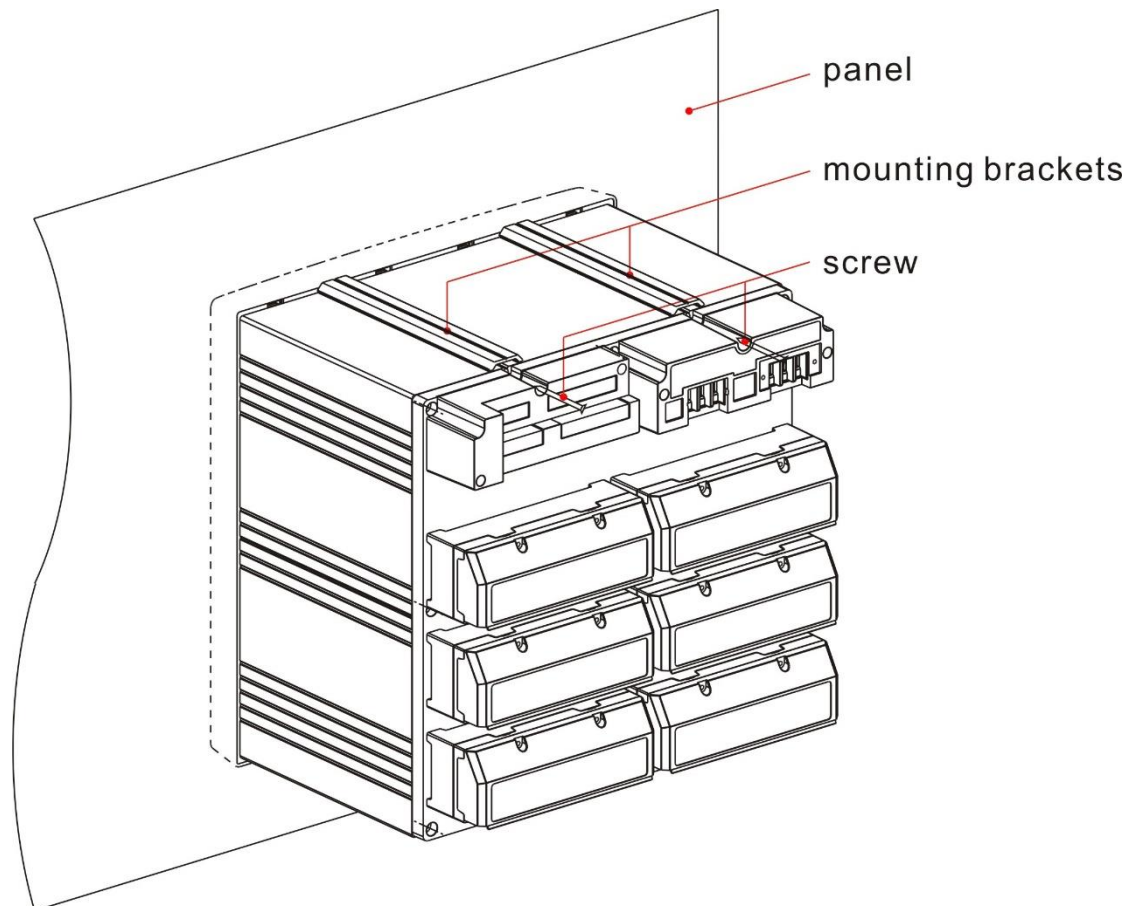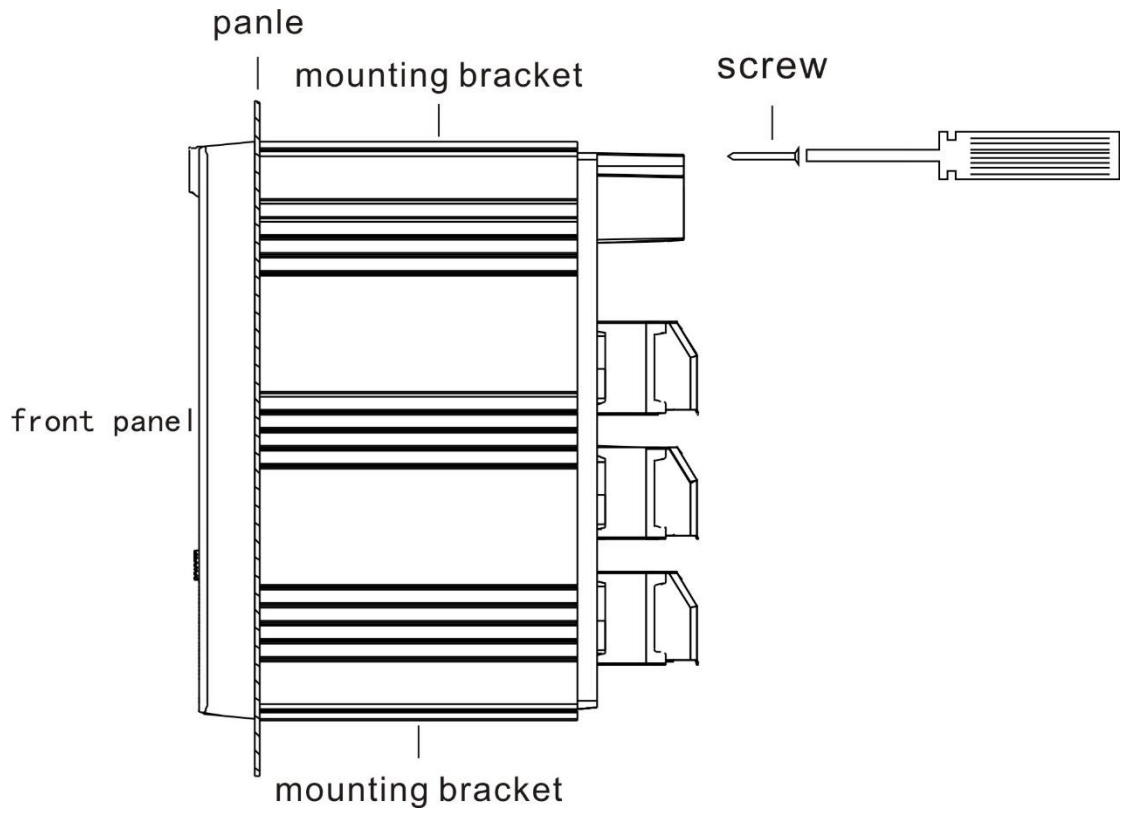
2.3 the arrangement of various terminals

Due to different configurations, the arrangement of every instrument for the wiring terminal in various channels is different. Please refer to the terminal graph on the terminal cover.
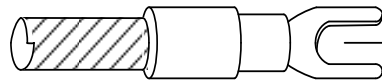
When relay loop number is more than 24, signal terminal 4 will function as the alarm terminal.

2.4 input and output signal wiring

Precautions to be taken while wiring

Take the following precautions when wring the input signal cables.

It is recommended that crimp-on lugs (designed for 4 mm screws) with insulation sleeves be used on the lead wire ends.

crimp-on lugs (designed for 4 mm screws) with insulation sleeves be used on the lead wire ends.

Take measures to prevent noise from entering the measurement circuit.

- Move the measurement circuit away from the power cable (power circuit) and ground cable.
- It is desirable that the item being measured does not generate noise. However, if this is unavoidable, isolate the measurement circuit from the item. Also, ground the item being measured.
- Shielded wires should be used to minimize noise caused by electrostatic induction. Connect the shield to the ground terminal of the instrument according to the need (make sure you are not grounding at two points).
- For the interference generated by electromagnetic induction, if splicing the equidistant dense circuit wiring, it will be more effective.
- The resistance of ground terminal is lower.

When using the thermocouple input, take measures to stabilize the temperature at the input terminal.

- Always use the input terminal cover.
- Do not use thick wires which may cause large heat dissipation (cross sectional area $0.5mm^2$ or less recommended).
- Make sure that the ambient temperature remains reasonably stable. Large temperature fluctuations can occur if a nearby fan turns ON or OFF.

Connecting the input wires in parallel with other devices can cause signal degradation, affecting all connected devices.

If you need to make a parallel connection, then

- Ground the instruments to the same point.
- Do not turn ON or OFF another instrument during operation. This can have adverse effects on the other instruments.
- RTD cannot be wired in parallel.
- Current signal cannot be wired in parallel.

WARNING
To prevent electric shock, ensure the main power supply is turned OFF

Wiring Method

1. Turn OFF the instrument and remove the input terminal cover.
2. Connect the input/output signal wires to the input/output terminals.
3. Fit with the rear terminal cover and supply electricity.

The arrangement of signal terminal for various channels

Take the 24-way universal input +4 way analog ouput as an example:
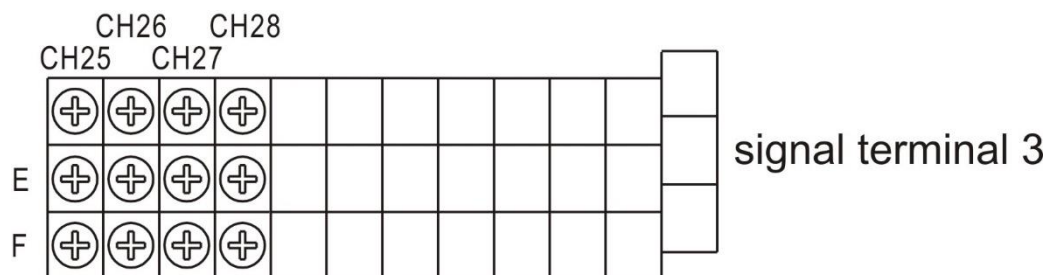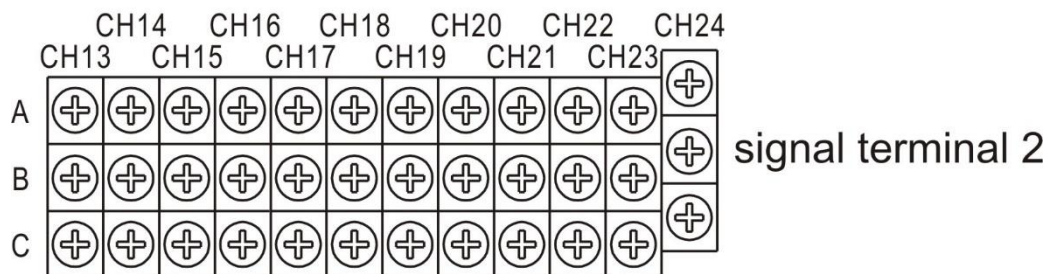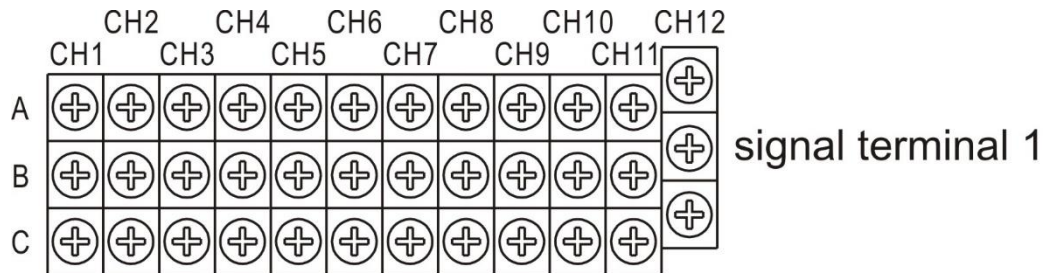
* ☐ represent the unused terminal

Wiring diagram
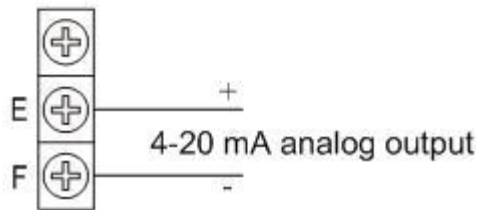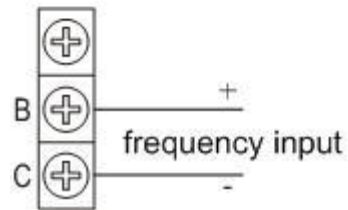
Tips：When select [digital] signal for input channel, select the wiring mode of [DC voltage input] for [Voltage], and [RTD signal input] for [Switch].

2.5 alarm output wiring (option)

WARNING
- To prevent electric shock, ensure the main power supply is turned OFF.
- If a voltage of more than 30 VAC or 60 VDC is to be applied to the alarm output terminal, use ring-tongue crimp-on lugs with insulation sleeves on all terminals to prevent the wires from slipping out when the screws become loose.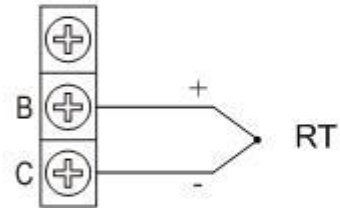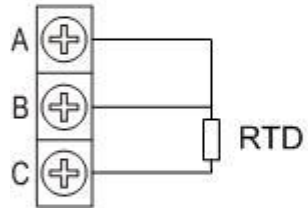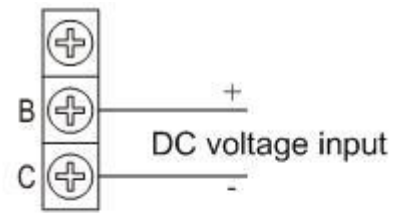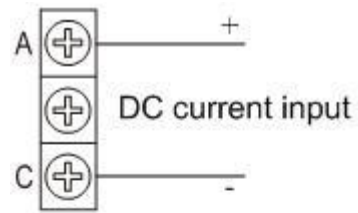 Furthermore, use double-insulated wires (dielectric strength of 2300 VAC or more) for the signal wires on which a voltage of more than 30 VAC or 60 VDC is to be applied. For all other wires, use basic insulated wires (dielectric strength of 1350 VAC). To prevent electric shock, attach the terminal cover after wiring and make sure not to touch the terminals.

Wiring Procedure
1. Turn OFF the instrument and remove the cover for the rear terminal.
2. Connect the alarm output cables to the terminal.
3. Replace the terminal cover and fasten it with screws.

CAUTION

Remove the rear terminal cover to wire easily. In order to prevent poor contact, tighten the screws after wiring

.

Relay Specifications

Item	Content
Output	Relay transfer contact
Output capacity	250VAC/3A 30VDC/3A
Dielectric	500VAC/one minute

Normally open alarm relay contact arrangement (e.g. the maximum channel number 36-way)
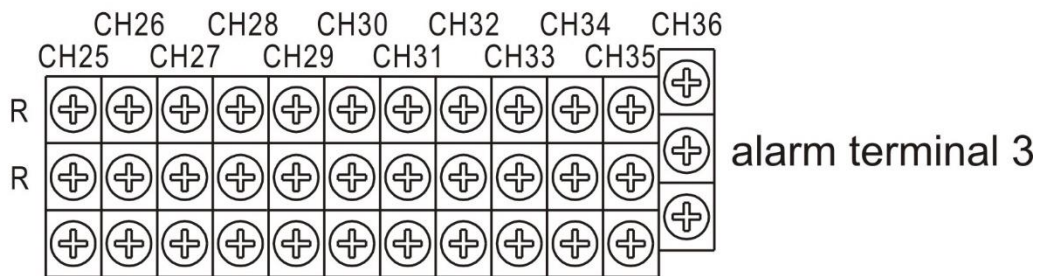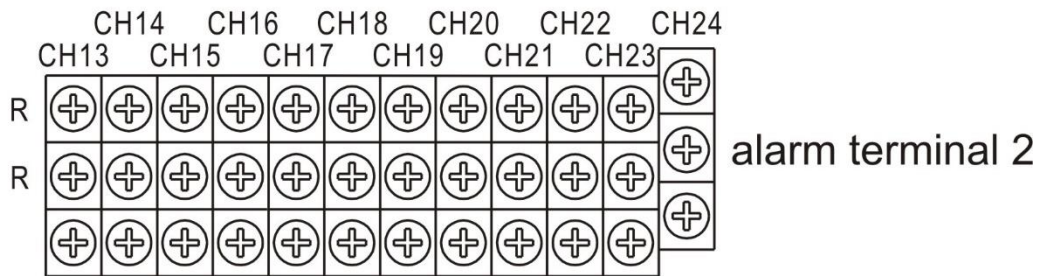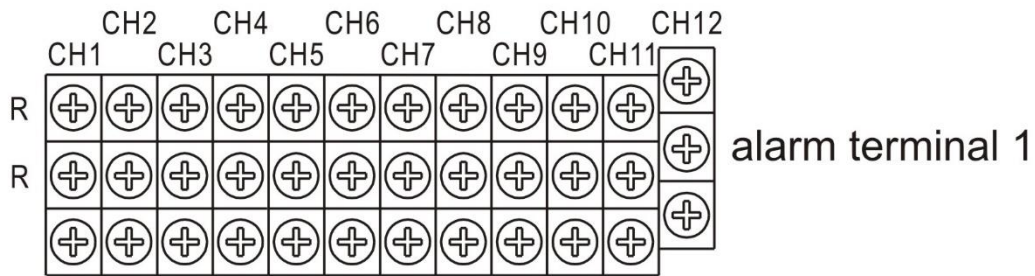
* Note

When the relay way is more than 24, signal terminal 4 will function as alarm terminal.

Wiring diagram

Normally open alarm relay
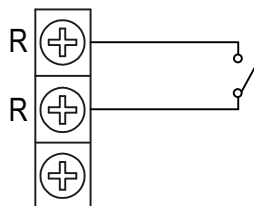
Normally closed alarm relay contact arrangement (e.g. the maximum channel number 18-way)

alarm terminal 1

alarm terminal 2
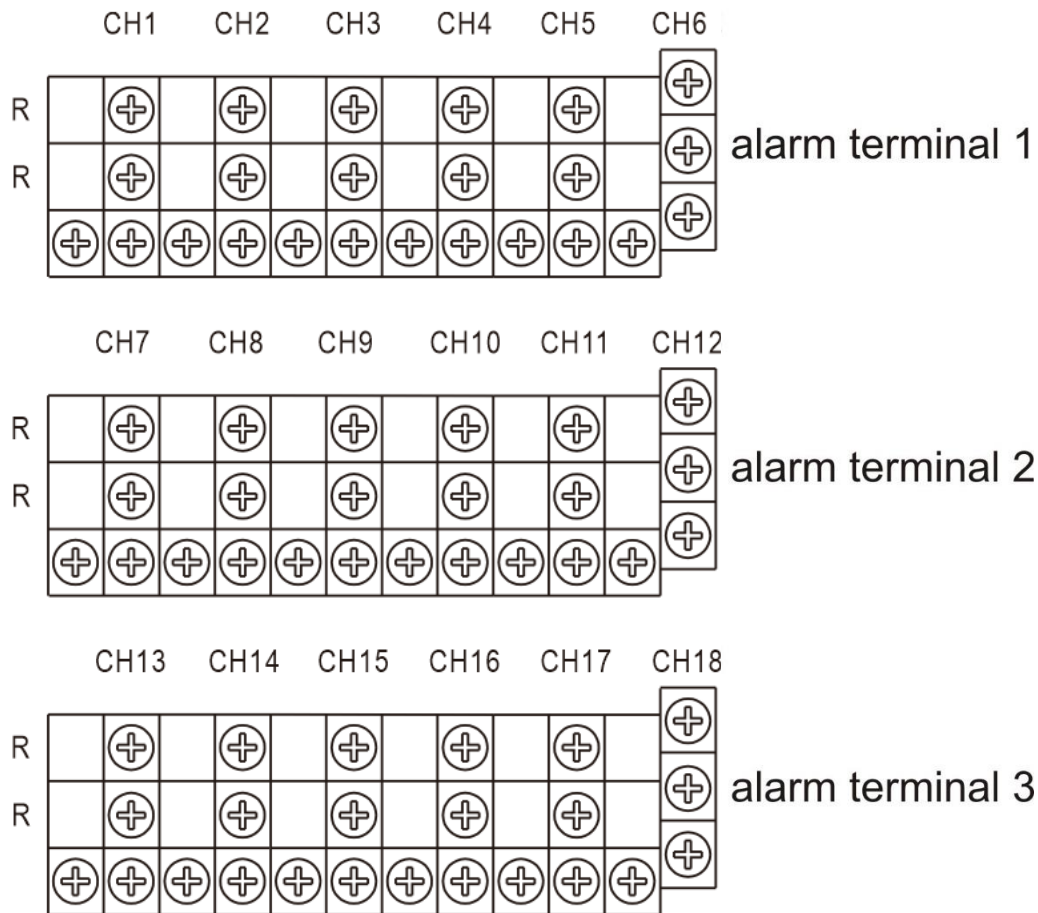
alarm terminal 3

* Note

When the relay way is more than 12, signal terminal 4 will function as alarm terminal.

Wiring diagram

Normally closed alarm relay
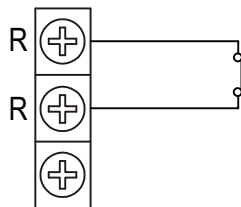
2.6 connect power supply

Here explains power wiring method. Be sure to read this part before connecting power.

Precautions to be taken when wiring the power supply
To prevent electric shock and damage to the instrument, observe the following warnings.

WARNING
- To prevent electric shock, ensure the main power supply is turned OFF.
- To prevent fire, use doubled-insulated wire
- Make sure to earth ground the protective earth terminal through a grounding resistance less than 10Ω before turning ON the power.
- Use crimp-on lugs (designed for 4mm screws) for power and ground wiring termination.
- Make sure to provide a power switch (double-pole type) on the power supply line in order to separate the instrument from the main power supply. Put an indication on this switch as the breaker on the power supply line for the instrument.
  Switch Specification   Rated current: 3A or more
- Connect a fuse (between 2A and 15A) to the power line.

Wiring Procedure
1. Connect the power supply wires and the protective ground wire to the power terminals.
2. Turn on the power.
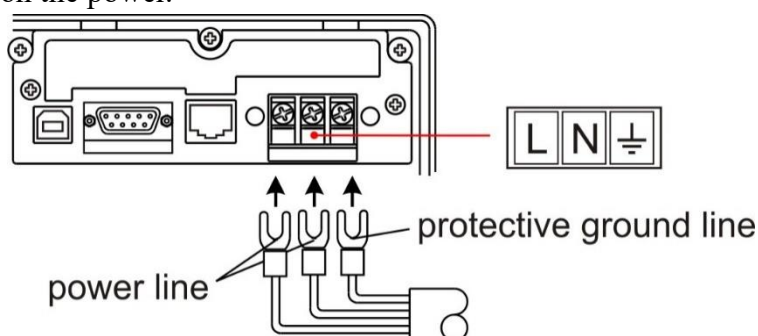
Relay Specifications

Item	AC supply
Input voltage	85VAC ~ 265VAC
Input frequency	50Hz

2.7 connect switching value

Switching value (digital) input can be used as the trigger conditions of the batch records. As for the related settings, please see "record configuration" section. Be sure to read this section before connecting input signal line of switching value.

Wiring

1. Turn off the power and remove the rear terminal cover.

2. Connect digital input signal line and the switching value input terminal line.

3. Install the rear terminal cover, and turn on the power

The arrangement of terminals

1D+	1D-	2D+	2D-

Contact specification

Item	Content
external signal line	Connect electrical level input terminal and termianl2 D+ terminal, and connect ground wire and 2D- terminal。
	Set the trigger of instrument record as " on-off". When the electrical level input terminal is high level (more than 4 V and less than 24V), the instrument stops recording; if it is low level (less than 2 V), the instrument starts recording.

2.8 24vdc transmitter power wiring (option)

Transmitter power output

CAUTION
●Never short-circuit the power supply terminals or apply an external voltage, otherwise damage to the instrument may result.

Wiring Procedure

1. Turn OFF the instrument and remove the cover of the rear terminal.
2. Connect the power line of transmitter to the output terminal.
3. Fit with the terminal cover and turn on the power.

The arrangement of transmitter power terminal

1P+	1P-	3P+	3P-	5P+	5P-
2P+	2P-	4P+	4P-	6P+	6P-
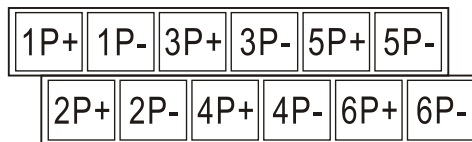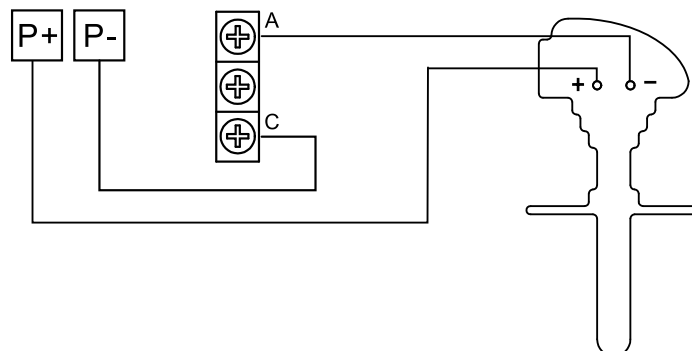
Wiring diagram

2-wire transmitter wiring diagram

24VDC Transmitter Power Supply

Loop： 8

Output voltage： 24VDC±10%

Maximum output current : 65mADC（over-loading protect current: about 90mADC）

2.9 RS232C/RS485 communication wiring

This instrument provides a serial interface, and type (RS 232C/ RS 485) can be ordered according to the specification

RS232C interface
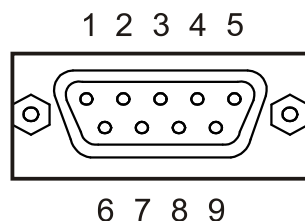
Pin number	Signal Name	Description
2	RXD	Receive data from the RS232 interface, and the instrument input signal
3	TXD	Send data to the RS232 interface, and the instrument output signal
5	GND	Signal Ground

RS485 interface

A   B   SG
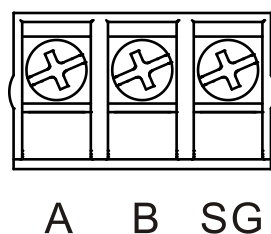
Terminal name	Description
A	Differential signalA （＋）
B	Differential signalB （-）
SG	Signal protective ground

Communication Specifications

Item	Content
Speed(baud rate)	1200/2400/4800/9600/19200/38400/57600/115200
Data format	Eight data bits，One stop bit Optional checkout code（None/odd/even）

2.10 connect special serial printer

This section will explain how to connect serial printer. Be sure to read it before connecting.

Wiring method

The terminal arrangement of serial printer interface

| RX | TX | GD | |

Explanation

The instrument and printer is connected through the printer special interface.

Instrument interface	Micro-printer interface
RX	RTS
TX	RXD
GD	GND

The instrument doesn't need to set any parameter, so it can print when connected to the printer.

CHAPTER 3 NAMES OF PARTS / RUN MODE / KEY OPERATIONS

3.1 names of parts and functions

Front Panel

page key
(switch operation screen)

right key
(move cursor to right)

down key
(move cursor to right
and decrease the
current value)

left key
(move cursor to left)

up key
(move cursor to right
and increase the current value)

enter key
(execute the current operation)
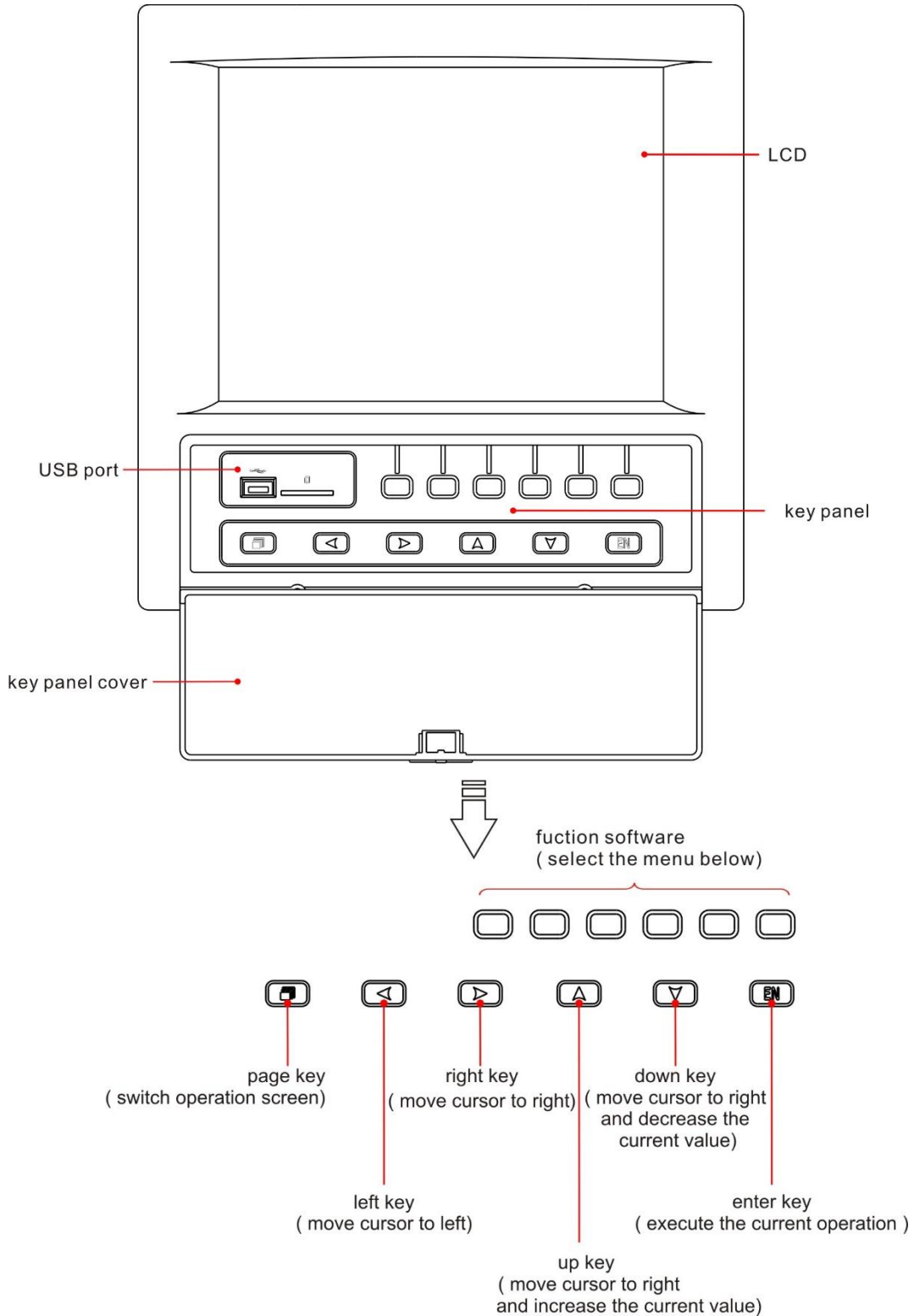
3.2 inserting/removing the external storage medium

This section describes the procedures to insert and remove the external storage medium.

USB disk and SD card can be used as external storage medium.

For the handling procedure of the storage medium, see section 〖back up history data〗.

Procedure

Inserting the storage medium

1. Open the front cover. Insert the U disk and SD card into the USB port.
2. The instrument detects the U disk and SD card in the drive automatically.
3. Enter Backup screen, and prepare to back up data.

CAUTION
- Keep the front cover closed during operation except when accessing the external storage medium. This will protect the storage medium and the drive from particles such as dust.
- Keep the metal face upper when inserting the U disk, otherwise the U disk can't be inserted.
- If you are using a commercially available U disk or SD card, be careful of static electricity.
- It is recommended using our company's products.

Remove the storage media

1. Make sure there is no data saved in storage media

CAUTION
- The access lamp is lit while the storage medium is being accessed.
- A message "Data are being saved to the medium." is displayed while data are being saved to the medium.

Description

Formatting external storage media

Use the external storage medium which has been formatted.

Please use the PC to carry on the formatting for the USB flash drives and choose FAT 32 system, because this product doesn't provide the formatted function.
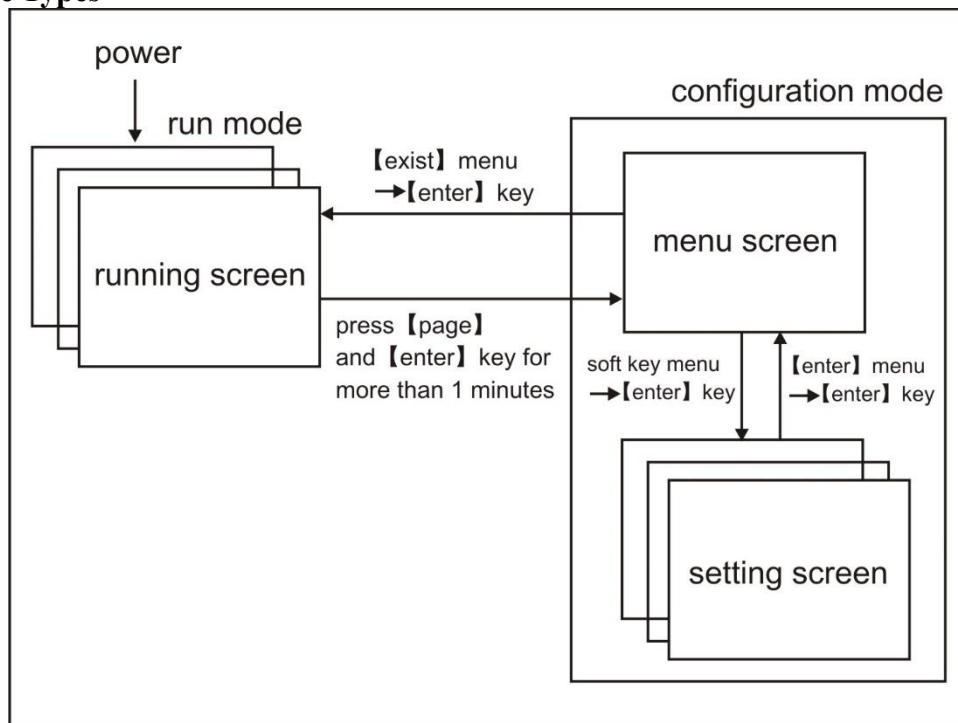
Specification

Item	Content
USB port	Support the USB 2.0 protocol. The maximum capacity is 4GB
SD card port	Standard SD card, support SDHC card.The maximum capacity is 4GB

3.3 run mode

There are two run modes: operating and setting. This section describes the functions and relationships of the two modes.

Mode Types

Mode Type	Content	Possible operations
Operation Mode	Data display and query mode of operation. This mode is entered when the power is turned ON. Use [Page Down] to switch the screen, while pressing the [next page] key and [confirmed] key to enter the configuration mode for more than 1 second.	• Display measured /operated data • Data acquisition • Data printing • Operation related to the file on the external storage medium.
Setting Mode	Operations such as measurements, alarm detection, and data acquisition are continued. This mode is entered by pressing the [Page] and [Enter] key for one second at the setting mode menu. Measured data can't be displayed in this mode. Continue to do measurement, alarm detection, data storage and other operation.	• Set a variety of configuration parameters

3.4 configuring the functions

Setting Mode

The configuration mode is used to set the various parameters of the running system.

Note
Change some system parameters will affect the data acquisition. We Suggest backing up data before the change.

Setting Items

User can carry out the following content in configuration mode:
- Setting system parameters
- Setting display parameters
- Setting signal input parameters
- Setting analog output parameters
- Setting alarm parameters
- Setting accumulation and reports parameters
- Setting print parameters
- Setting communication parameters
- Clearing data in the instrument
- Checking instrument hardware information and firmware

3.5 common key operations

This section describes common key operations which are often used.
[Left and right key]   [Left key] [Right key]
[Up and down key]   [Up key] [Down key]

Key operations in the running mode
Entering the running mode
1. Enter the running mode directly after power on
2. Select [Exit] to enter the running mode in the configuration mode.

Switching the screens under the running mode
Press [Page] to display each running screen in turn.

Key operations under the function screen
Enter the function screen

In the run mode, press the [PAGE] to switch to the function screen
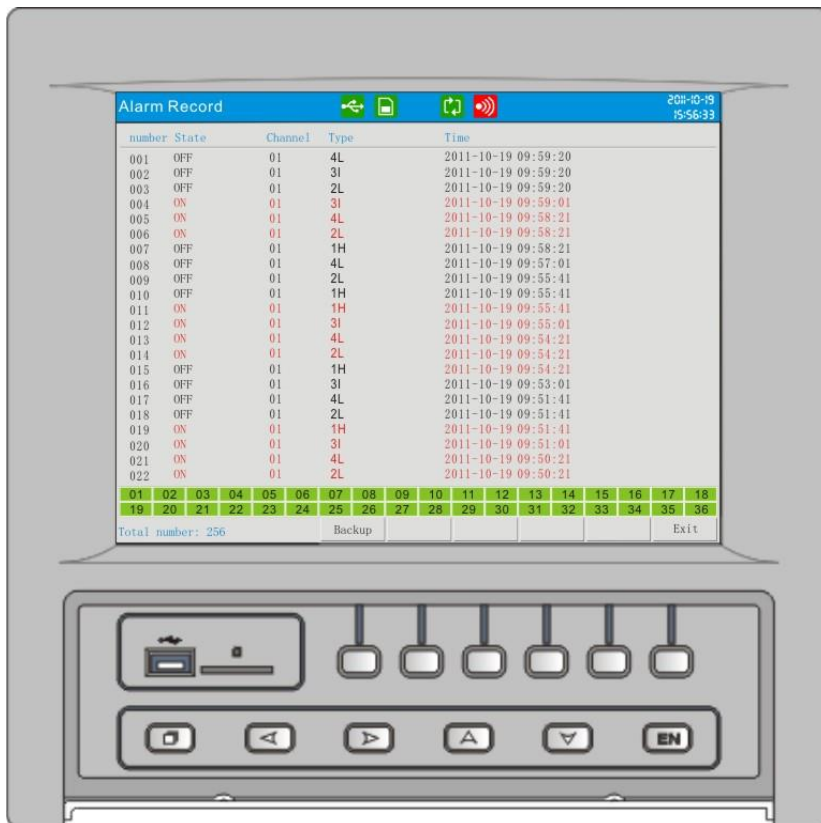**Select Function screen**
1. Use the[up and down] button and [left and right] button to move the cursor
2. Use the [Enter] to enter the corresponding screen

number	State	Channel	Type	Time
001	OFF	01	4L	2011-10-19 09:59:20
002	OFF	01	3I	2011-10-19 09:59:20
003	OFF	01	2L	2011-10-19 09:59:20
004	ON	01	3I	2011-10-19 09:59:01
005	ON	01	4L	2011-10-19 09:58:21
006	ON	01	2L	2011-10-19 09:58:21
007	OFF	01	1H	2011-10-19 09:58:21
008	OFF	01	4L	2011-10-19 09:57:01
009	OFF	01	2L	2011-10-19 09:55:41
010	OFF	01	1H	2011-10-19 09:55:41
011	ON	01	1H	2011-10-19 09:55:41
012	ON	01	3I	2011-10-19 09:55:01
013	ON	01	4L	2011-10-19 09:54:21
014	ON	01	2L	2011-10-19 09:54:21
015	OFF	01	1H	2011-10-19 09:54:21
016	OFF	01	3I	2011-10-19 09:53:01
017	OFF	01	4L	2011-10-19 09:51:41
018	OFF	01	2L	2011-10-19 09:51:41
019	ON	01	1H	2011-10-19 09:51:41
020	ON	01	3I	2011-10-19 09:51:01
021	ON	01	4L	2011-10-19 09:50:21
022	ON	01	2L	2011-10-19 09:50:21

Total number: 256   Backup   Exit

Function key operation

Click the corresponding function button below the screen to perform the operation.

Key operations in the configuration mode

Entering the configuration mode

1. Under the running mode, Press [Page] and [Enter] to enter the configuration screen.
2. Move the cursor and press the [Enter] to enter in the function screen
3. Move the cursor and press the [Enter] to enter different configuration screens.

Configure			2011-08-19 15:56:33
	System	Display	
	Input	Output	
	Record	Alarm	
	Report	Print	
	Comm	About	
	Cfg File		Exit

Selecting the parameter

Used [Left and right] button and [Up and down] button to move the cursor to the target key

Confirming operation

Press [Enter] to enter the target operation screen

Modifying the parameter

There are three types of the revisable parameters, namely, to adjust the input parameters, edit the input parameters and select input parameters.

● Adjust the input parameters

Use [Up] and [down] to set the cursor to adjust the content. [Enter] has the same function with [the up key] , except the function for pressing long.

● Edit the input parameters

If the editorial content is a value, use [up] and [down] key to adjust subtlety the parameters, and press [enter] to modify in the pop-up input panel .When the parameter can be edited, user can input Number, English (Caps), English, Symbol and Chinese.
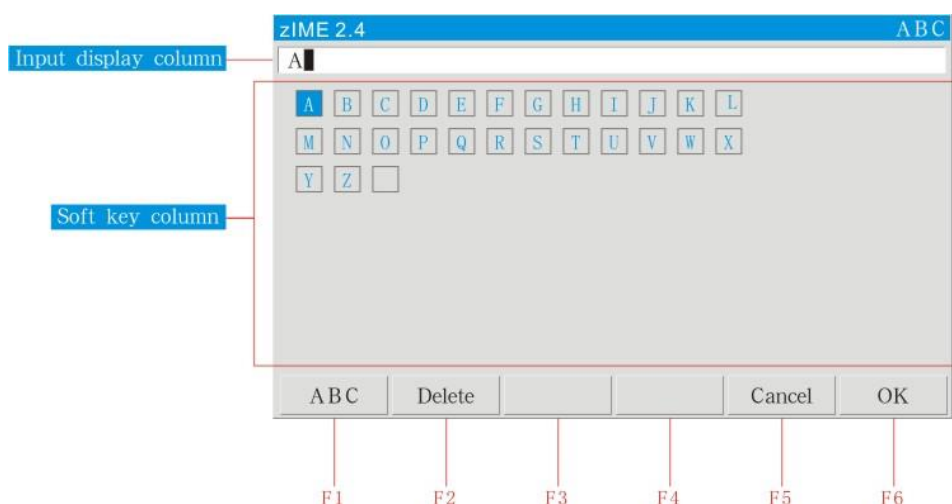
● Selecting input parameter

Press key [Up], [Down] [En] to pop up selection list, and use key [Up], [Down] to move cursor. [En] is used to confirm selections; [Page] means cancel.

Move the cursor to the parameters which need editing, then an input panel will pop up after pressing [Enter], and the user can input.

Input Number/English (Caps)/English/Symbol

　　　Used in inputting range, unit, tag etc.

Procedure

[Left][Right][Up][Down] ：Move the cursor to the soft key area (including character soft key input and Pinyin Chinese character selection).

[Page]： Switch the cursor's to 【En】 key if there is no Pinyi.Otherwise, switch the cursor to the Chinese character, and switch between the Chinese character and [En key]

[En]： Input the character to the input field, which under the place of cursor.

[Function Key]: the related operation in the corresponding function soft key：
    [F1] : switch the input method(switching input method)
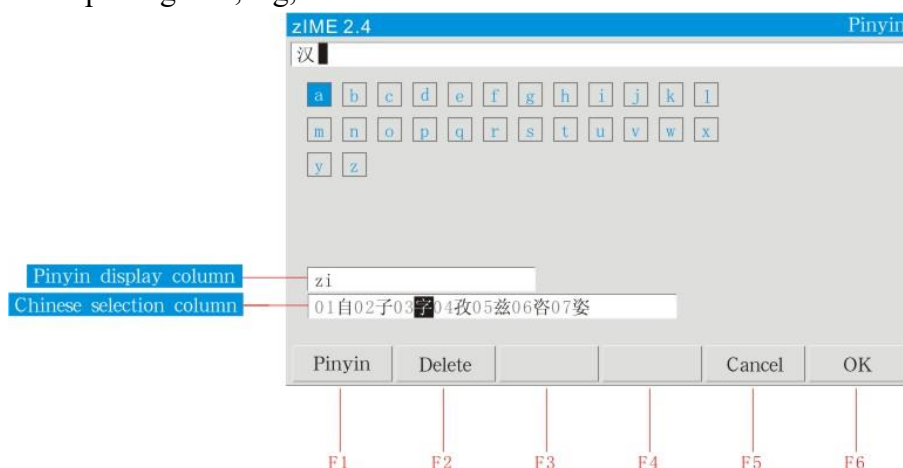   [F2]: 【Delete】(delete the last character in the input window)
    [F3]和[F4]: no operation；
    [F5]: 【Cancel】(canel all the editing operation and exit the inout panel);
    [F6] : 【Finish】(finish the editing content and exit the input panel)

Input Chinese characters

Used in inputting unit, tag, etc.

Operation

1. Use the [left] [right] to move the cursor to the alphabet 'z', use the [En],the phonetic show bar display" z", It is the same case with the operation of alphabet 'i'.

2. Use the [Page Down] to jump the cursor to columns "selecting Chinese characters" (also can use the [left and right key] and [up and down key])

3. Use the [up and down keys] to accented characters, which show icon characters.

4. Use the [left and right button] to move the cursor to the character "Zi", use the [En] to select.

5. Use the [Up] and [Down] to jump the cursor to the [En] (can also use the [left and right button]), and use [En] to confirm exit.

Examples

Revise unit to "wan m^3 / h"

Remove the original information

[Enter]: Entering Input Panel.

【Delete】 soft key: Delete the original information in the input display column for many times until the input display column is blank.

Input "Wan" character

Choose 【Pinyin input method】: [left] to move the cursor, [enter] to confirm

Input alphabet 'wan': [left] to move the cursor, [enter] to confirm

The cursor to select 【Chinese】 area: [Page] to switch or [left and right buttons] to move the cursor

Select "Wan" character: [up and down keys] to page down to accented characters, [Enter] to select.

Input "m" word

Choose 【lowercase input method】: Move the cursor with [Left and right] button. [Enter] to select.

Choose the letter 'm': [left and right button] to move the cursor, [Enter] to confirm.

Enter "^{3}"

Select a "special Input Method": Move the cursor with [Left and right] button, [Enter] to select.

Select special character "3": [left and right button] to move the cursor, [Enter] to select.

Enter "/" character

Choose 【Symbol input method 】: Move the cursor with [Left and right] button, [Enter] to select.

Select symbol '/': [left and right button] to move the cursor, [Enter] to select.

Enter "h" character

Choose 【lowercase input method】: Move the cursor with [Left and right] button, [Enter] to select.

Choose the letter 'h': [left and right button] to move the cursor, [Enter] to select.

Verify the editing

move the cursor to the 【Enter】 button: Move the cursor with [Left and right] button, confirm editing, exit Input Panel: use [Enter] key。

# CHAPTER 4 DISPLAY SCREENS AND ITS FUNCTION

4.1 switching operation screens

This chapter describes the screen (operation screen) used to display the measured / computed data.

The operation screens are composed of digital display, bar, real-time trend, history, function screen.

Alarm summary, data print (additional function) and backup (additional function), the cumulative report (additional specification) , power-down recording and system logs and other screens enter through the data query screen.

Use the [Page] key to switch each screen.
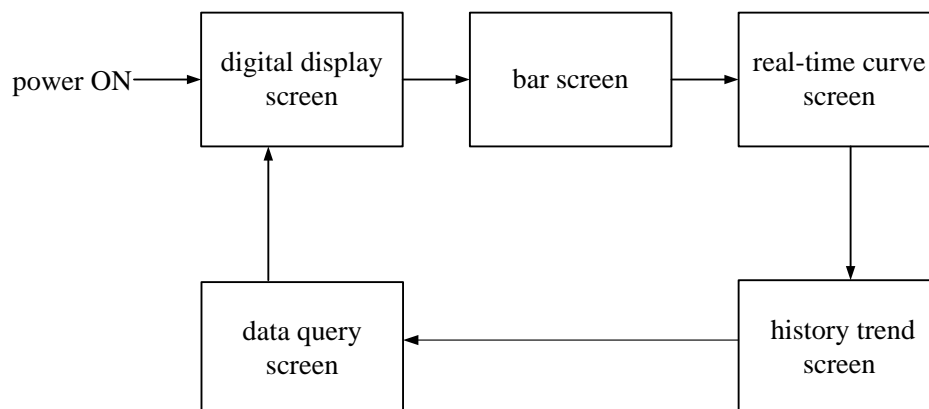
4.2 explanation of the status display section

The following information is displayed in the status display section during the operation mode and the configuration mode.

1. **Screen name column**
   Data show the combination number of screen display, if not use the combination number, then show 【device name】. Data query screen and the configuration screen show the display name.

2. **SD Card Connection logo**
   A: SD card connection is working.
   B: Automatic backup of data is being written (A/B displays in turns.).
   No show: No SD card connector or connection failure.

3. **USB Device Identification**
   Display: There are USB devices and instrumentation connections.
   No Show: No USB devices and instrumentation connections or connection failure.

4. **Circulation display flag**
   Circulation icon： Circulation Display each group
   None： Fixed screen, there is no circulation.

5. **Mode symbol of storage recording**
   C icon: the recording mode is circular, and the file is recording
   D icon: the recording mode is circular, and the file stops recording
   E icon: the record mode is not circular, and the file is recording
   F icon: the record mode is not circular, and the file stops recording

6. **Relay output flag**
   Display icon: There are alarms generated.
   No Show: No alarm generated.

7. **AD board working state flag**
   No Show: the instrument is working well.
   Display icon: abnormal working state of AD board.
   Note: if the instrument displays his flag, this means it doesn't function well, please contact the supplier.

8. **Current data and time**

4.3 digtal display screen

The digital displays measured / computed data. On the way of display, please refer to the section 『switch to run the screen』.

Use [up and down keys] to switch displayed combinations .It can display up to 8 combinations.If display of combinations don't show configuration, skip this display combinations.

The order to switch combination is shown in the following picture:
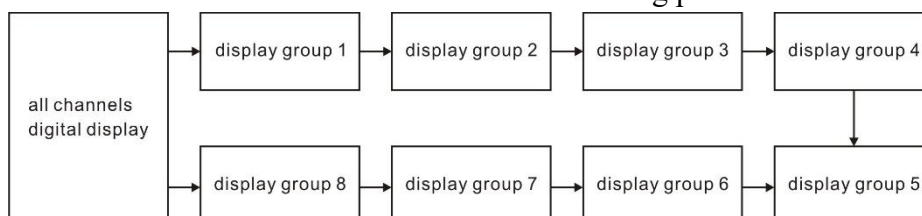
Use [Enter] to start or stop the automatic switching function of display combinations, every 5 seconds automatically switch to the next combination curve, with a status bar icons.

Screen dispays as follows:
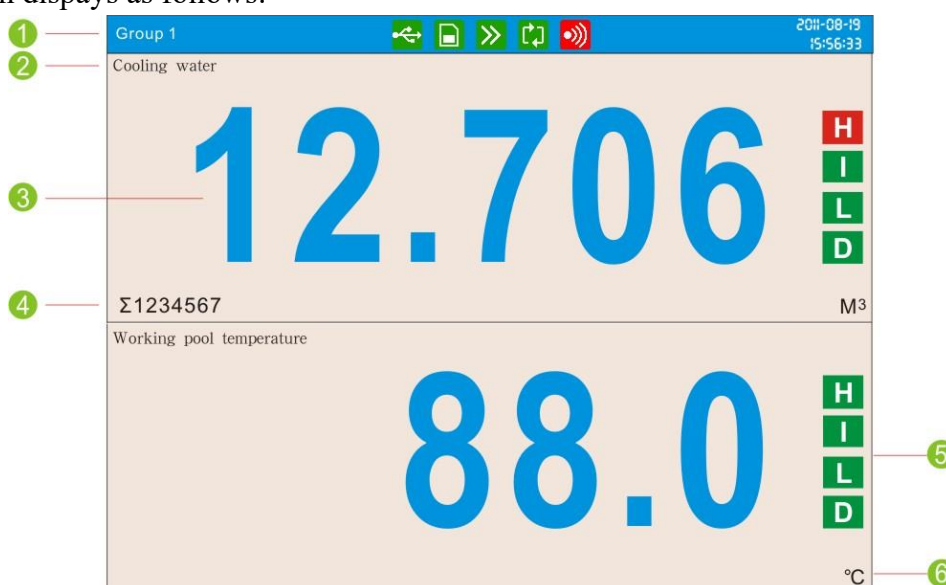
1. Show combination numbers in the title bar, all channels show 【Device name】

2. Channel tag, can be set. With regard to setting method, See section 『Channel Tag and Unit Setting』

3. Measurement of channel /computed data. Blue is Normal, red is alarming
   Note
   - Measure the channel's data display
     When measuring data of measurement channel anomalies (see below), the screen shows measurements for -.--.
   - Data exception
     4-20 mA : signal is bellow2 mA.
     1-5V: measured signal is bellow 0.5V, and the [burnout] display an error flag
     The thermocouple burnout, and the [burnout set] display an error flag.
   The thermal resistence burnout, and the [burnout set] display an error flag.

4. Channel accumulation value. It displays when the user selects [channel accumulated] function.

5. Channel unit can be set. With regard to setting method, see section 〖Channel Tag and Unit Setting〗

6. Alarm symbol. 4-channel alarm can be set up, Green is normal, red is alarm.

4.4 bar graph display

Bar graph displays the measured / operated data. On the way to show, please refer to
『switch running screen』

Using [up and down keys] to switch combinations of display. It can display up to 8
combinations.If display of combinations don't show configuration, skip this display
combinations.

The order to switch combination is shown in the following picture:
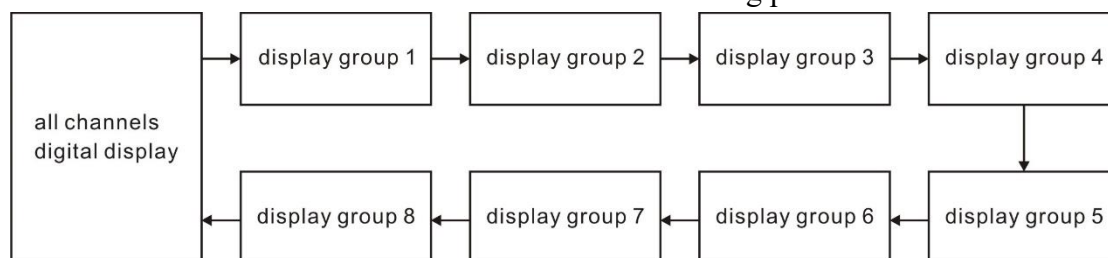
Use [Enter] to start or stop the automatic switching function of display combinations,
every 5 seconds automatically switch to the next combination curve, with a status bar
icons.

Example of screen display is shown in the following picture:
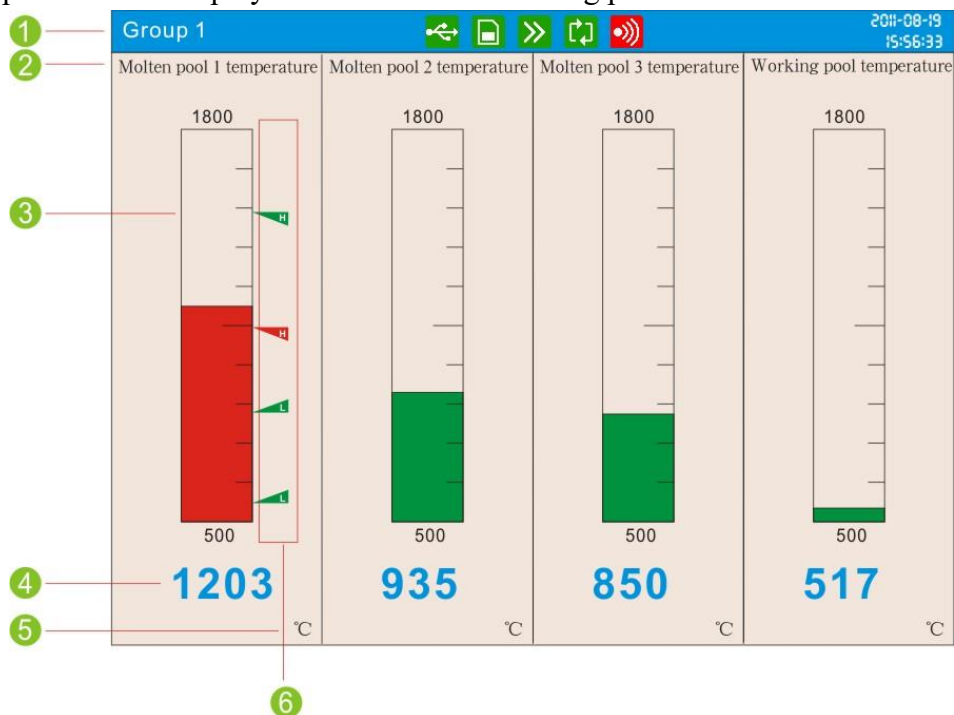
1. Show combination numbers, all channels show 【Device name】
2. Channel tag, can be set. With regard to setting method, See section 『Channel Tag
   and Unit Setting』
3. Bar. Bar chart ruler has the length of 10 grids, and the length of filling color
   represents proportion in percent. Green is normal, red is alarm.
4. Measurement of channel /computed data. Blue is normal, red is alarming
   Note
   ● Measure the channel's data display

When measuring data of measurement channel anomalies (see below), the screen shows measurements for -.--.

- Data exception

  4-20 mA : signal is bellow2 mA.

  1-5V: measured signal is bellow 0.5V, and the [burnout] display an error flag.

  The thermocouple burnout, and the [burnout set] display an error flag.

  The thermal resistence burnout, and the [burnout set] display an error flag.

5. Channel unit can be set. With regard to setting method, see section 『Channel Tag and Unit Setting』

6. Alarm symbol. 4-channel alarm can be set up, green is normal, red is alarm. The place in which the warning signs are located in the bar is where the alarm sets limits in the range of the position, which is only effective against H/L alarm.

4.5 real-time trend screen

The waveform displays measured / operated data. On the way to show, please refer to
『switch running screen』

Using [up and down keys] to switch combinations of display. If display of
combinations don't show configuration, skip this display combinations.. When all the
combinations show no configuration, each 8-channel has circular display according to
the order of combination of channels.
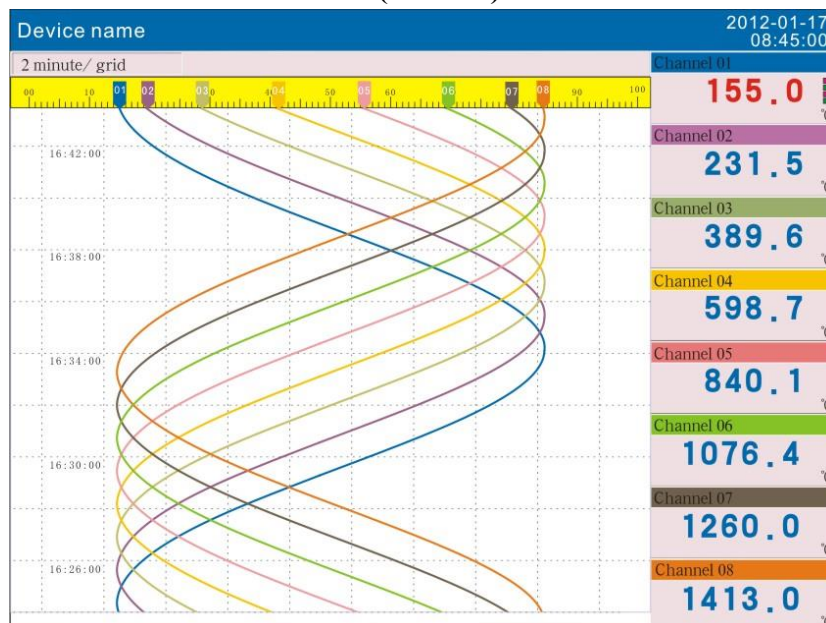
- Combined mode of curve cycle
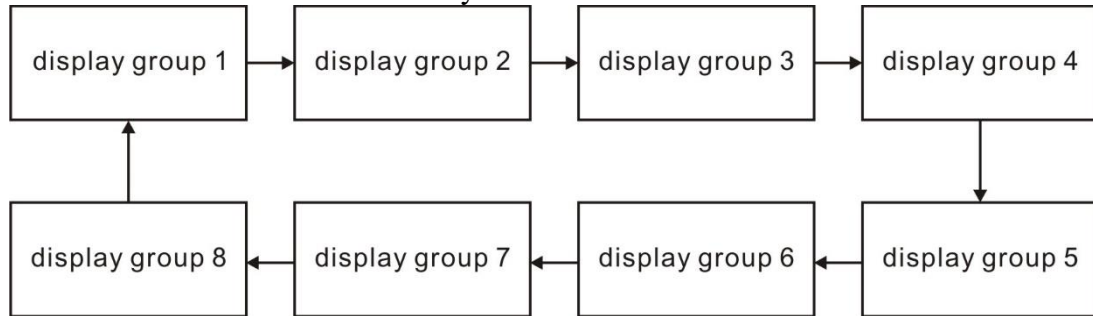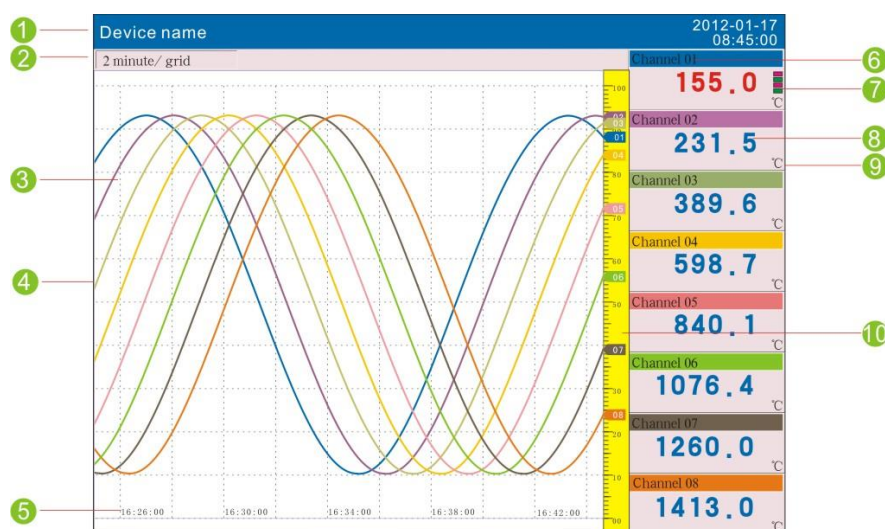

- Uncombined model of curve cycle
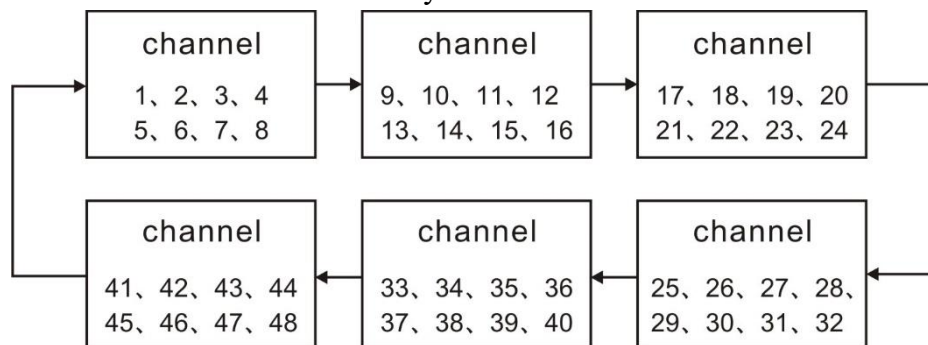
Use [Enter] to start or stop the automatic switching function of display combinations,
every 5 seconds automatically switch to the next combination curve, with a status bar
icons.

An example of Real-time curve show (vertical)

An example of Real-time curve show (horizontal)

1. Show combination numbers, all channels show 【Device name】
2. Trend cycle. Each grid means the length. The cycle is related with recording interval, each grid time length = recording interval × 60.
3. Grid. Estimate the time and data value.
4. Data trend. Most display 8 trends at the same screen.
5. Time of the current grid.
6. Channel tag, which can be set. With regard to setting method, See section 『Channel Tag and Unit Setting』. Background color and this corresponding trend color are identical.
7. Alarm symbol. 4-channel alarm can be set up, green is normal, red is alarm. The place in which the warning signs are located is top-down arrangement, which is corresponding to the configuration in the 【Alarm configuration】 screen.
8. Measurement of channel /computed data

Note

● Measure the channel's data display

When measuring data of measurement channel anomalies (see below), the screen shows measurements for#####。

● Data exception

4-20 mA: signal bellows 2 mA.

1-5V: measured signal is bellow 0.5V, and the [burnout] display an error flag.

The thermocouple burnout, and the [burnout set] display an error flag.

The thermal resistence burnout, and the [burnout set] display an error flag.

---

9. Channel unit can be set. With regard to setting method, see section 『Channel Tag and Unit Setting』
10. Scale. Display the percentage of the trend.

Curve refresh: every pixel in the timeline of LCD screen timeline represents a record of each interval. Each interval in the curve moves once.

4.6 history trend screen

Display the measured / operated data stored in the memory with historical curve.
On the way to show, please refer to 『switch running screen』
There exist two methods to search historical data. One is continuous and the other is fixed point. Historical Curves show no alarm.
Curve direction on paper is according to the configuration display, with horizontal or vertical two options.

Horizontal historical Curve
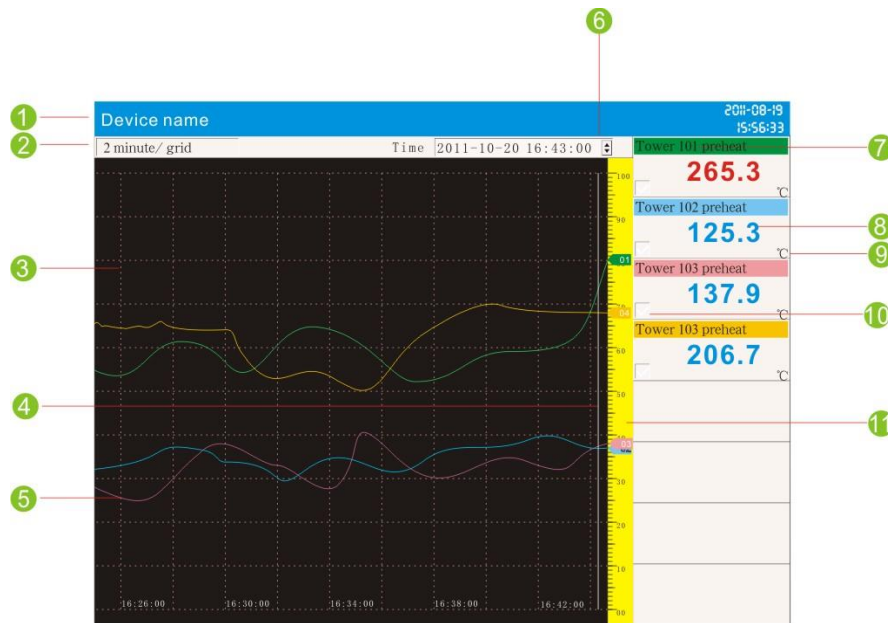
1. Show combination numbers, all channels show 【Device name】
2. Trend cycle. Each grid means the length. The cycle is related with recording interval, Time length = recording interval ×Zoom multiple× 60.
3. Grid. Estimate the time and data value.
4. Searching stick. Estimate the time and data value.
5. Data trend. Most display 8 trends at the same screen.
6. Searching time. Show the time where the cursor is located in the trend.
7. Channel tag can be set. With regard to setting method, See section 『Channel Tag and Unit Setting』.. Background color and this corresponding trend color are identical.
8. Historical data of channels. Show the data of channels that the Meter recorded.
9. Channel unit can be set. With regard to setting method, see section 『Channel Tag and Unit Setting』
10. Trend display symbol. "√" display, "×" hide.
11. Scale. Display the percentage the trend.

Procedure:
● Cursor searching state
Switching curve combination
Using [up and down keys] to switch combinations of display. If display of combinations don't show configuration, skip this display combinations.When all the combinations show no configuration, each 8-channel has circular display according to the order of combination of channels.

Combined cycle mode of curve
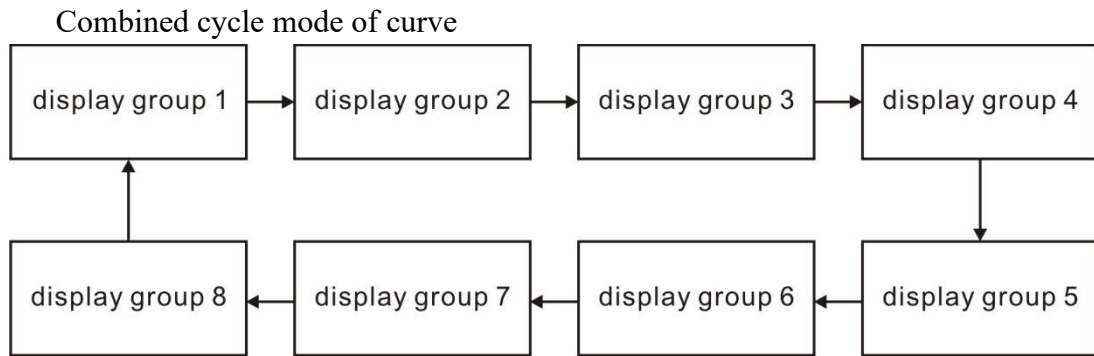
Non-combined cycle mode of curve
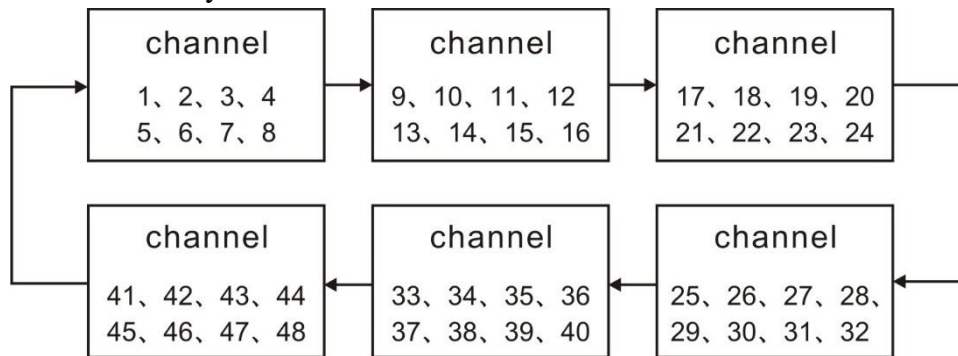
Cursor searching mode operation
Use [left and right button] to move the cursor for time forward or backward searching operation, and press [left and right button] to accelerate searching
Switch searching mode
Use [Enter key] to switch the searching mode.

● Searching mode
Searching mode operation
Use [left and left button] to move the cursor to the searching time, use the [up and down keys] to set the date and time to the required searching time, then press [Enter key], the trend will be automatically moved to the set point in time, and the searching point is at the far right of the screen.

Scaling curve
Use [Left] [Right] to move the cursor to the curve of cycles, and use [Up] [Down] to adjust zoom curve.
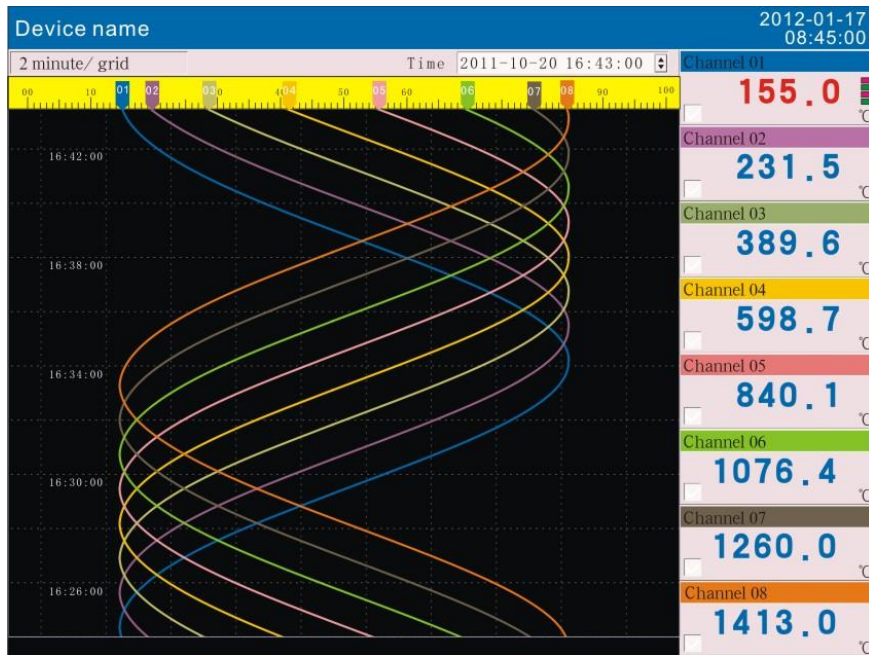
47

Show or hide a curve

Use [Left] [Right] to move the cursor to the curve show / hide, press [Up] or [down], you can hide or show the curve.

Switch the continuous state and the fixed point state

Press [En] to switch to the cursor state.

**Longitudinal history curve**

Procedure:

● Cursor state

Switching curve combination

Using [up and down keys] to switch combinations of display. If display of combinations don't show configuration, skip this display combinations.When all the combinations show no configuration, each 8-channel has circular display according to the order of combination of channels.

Combined mode of curve cycle
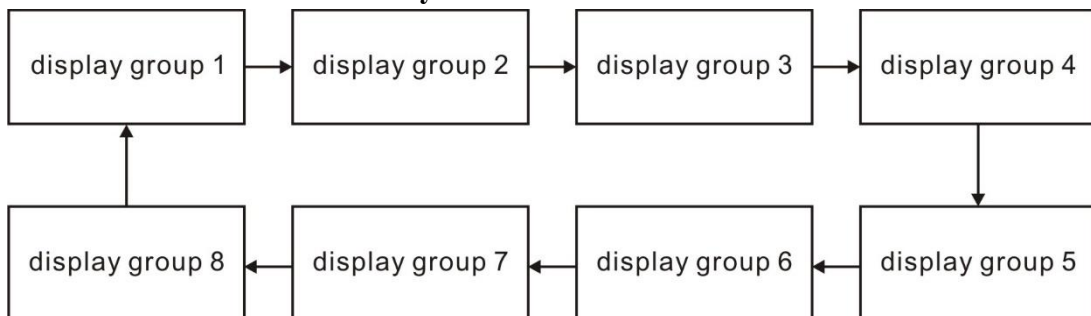
Non-combined cycle mode of curve
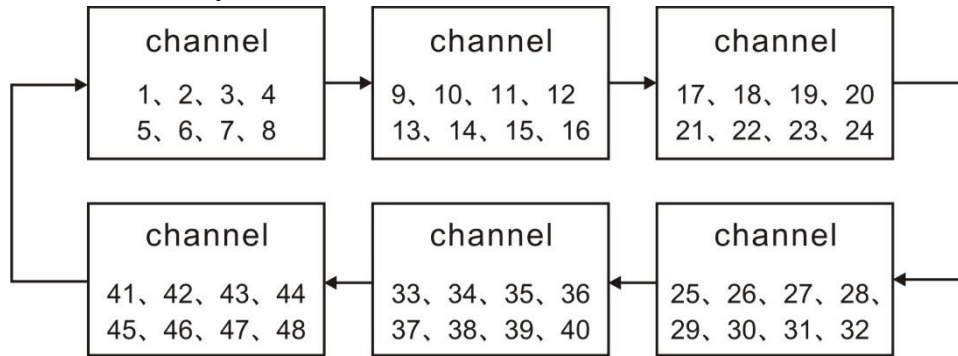
Cursor state
Uses [Up] and [Down] to move cursor so that forward or backward searching is available. Long press [up and button] can accelerate continuous mode.

Switch the continuous state and the fixed point state
Press [En] to switch to the fixed point state.

● Searching mode state
Operation of searching mode state
Uses [Left] and [Right] to move cursor to searching time. Set the data time to a desired point by using [Up] and [Down]. Press [En], the trend will be moved to the fixed point automatically. The fixed point is on the right hand.

Scaling curve
Use [Left] [Right] to move the cursor to the curve of cycles, and use [Up] [Down] to adjust zoom curve.

Show or hide a curve
Use [Left] [Right] to move the cursor to the curve show / hide, press [Up] or [down], you can hide or show the curve.

Switch the continuous state and the fixed point state
Press [En] to switch to the fixed point state.

4.7 function screen

This section describes the screen entrance for the instrument internal data (historical data, alarm list, accumulation, accumulative statements, power-down recording and system logs) to back up, print, view, etc.
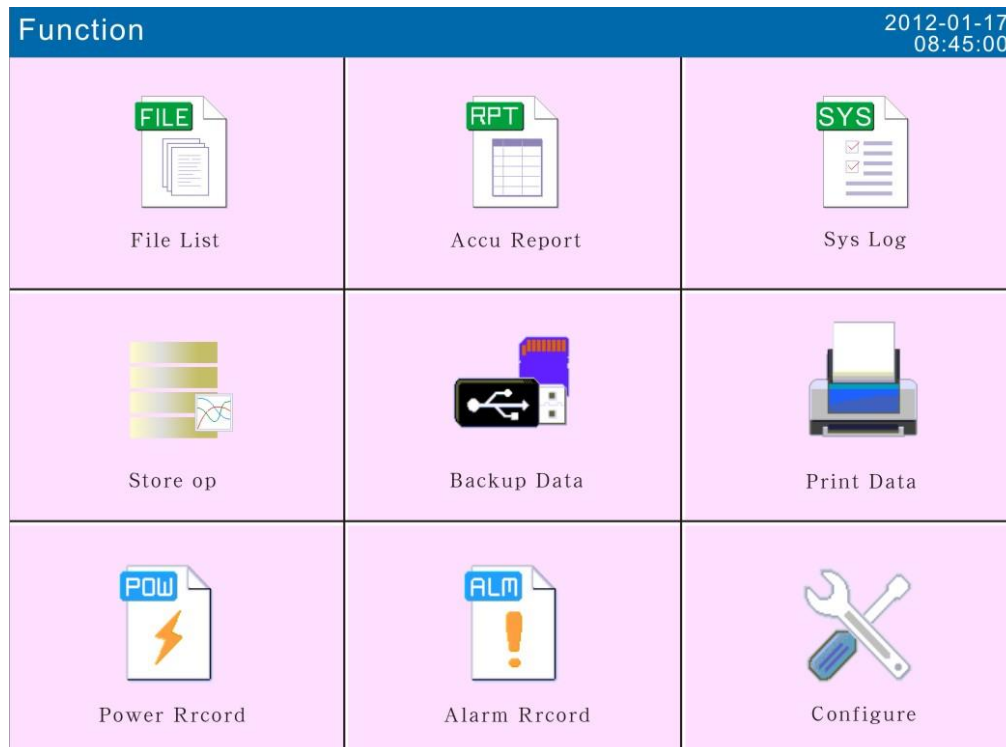
Operation:
Use [left and right button] to move the cursor
Use [Enter key] to enter the corresponding screen

4.8 file list

This section shows file storage and file storage status information.
On the display method, see the section 〖switch run screen〗

1. Number: Records arranged by time, the nearer it occurs, the farther it is arranged.
2. Starting time: the starting time of data record in the file.
3. End time: the end time of data record in the file.
4. Status: Display the current state of file records, and the file state is as follows:
    Being recorded: the file is recording data;
    Manually stopped: because of changes in the configuration data or manually key operation, file stops recording;
    Power-down stop: due to power down, file stops recording;
    Alarm stop: due to alarm cancellation, the file stops recording;
    Switch stop: because the external switching device is disconnected , the file stops recording;
    Time stop: because the file reaches the set time for the end, it stops recording.
5. Key operation: Use the [up an down keys] to move the arrow to the file number you want to view;
    Press [F1] ([trend])to the historical trend screen for viewing the historical trend data, and then use the [Page] to return to the file list screen;
    press [F2] ([backup])to the history data backup screen for a single file to back up it . Then, use the [Page]   to return to the file list screen;
    press [F3] ([print])to data print screen . Then, use the [Page] to return to the file list screen;
    Press [Page] or [F6] ([Exit] key)to return to the current file list screen.

4.9 storage operations

This section displays record configuration information and file storage, for the recording configuration, please refer to the section 『record configuration setting』 .

On the display method, please refer to 『switch run screen』
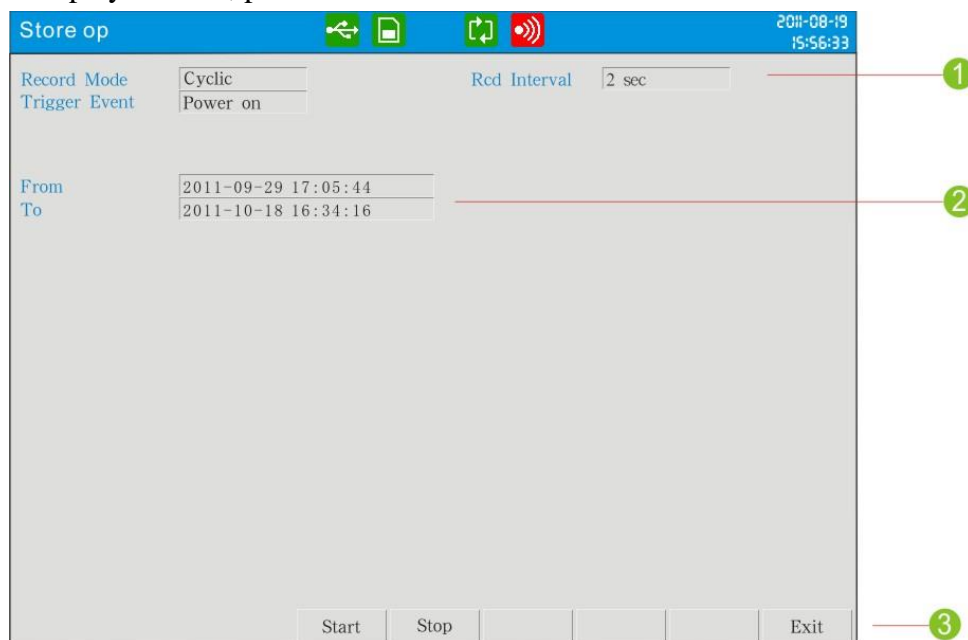
1. Instrument records the configuration information.
2. The starting time and end time of file storage in the instrument.
3. Menu: When the record configuration trigger is set to be manual: Press [Start key], the instrument starts to recording; Press [Stop key] , the instrument stops recording. Use the [Exit key] to return to the function screen.
    Note: The Storage operation interface display varies according to the different record configuration setting.

4.10 data backup

This section describes how to use the U disk and SD card to backup historical data.
On the way to show, please see the section   and 【Switching the running screen 】
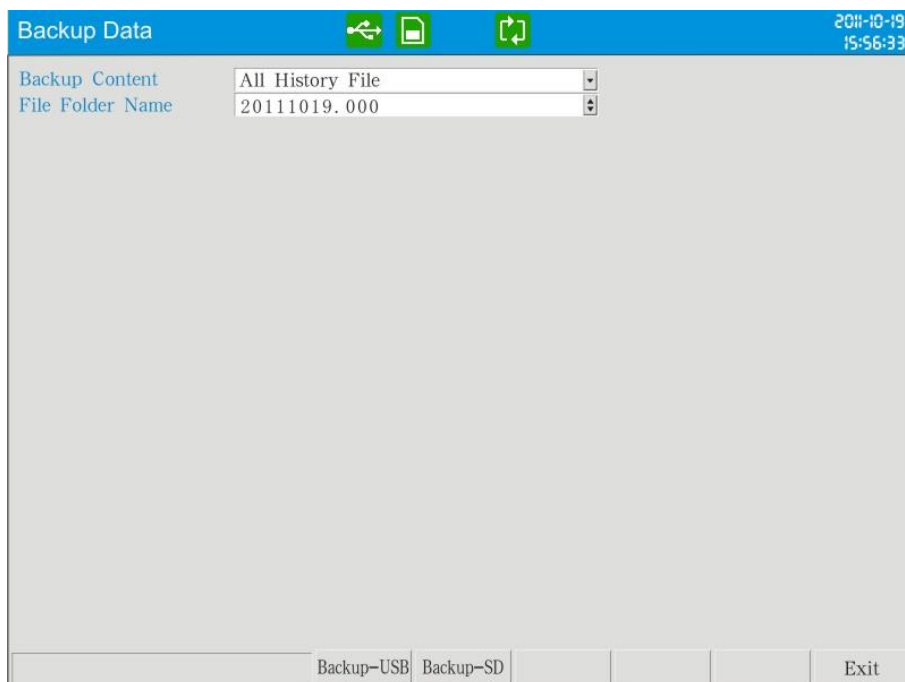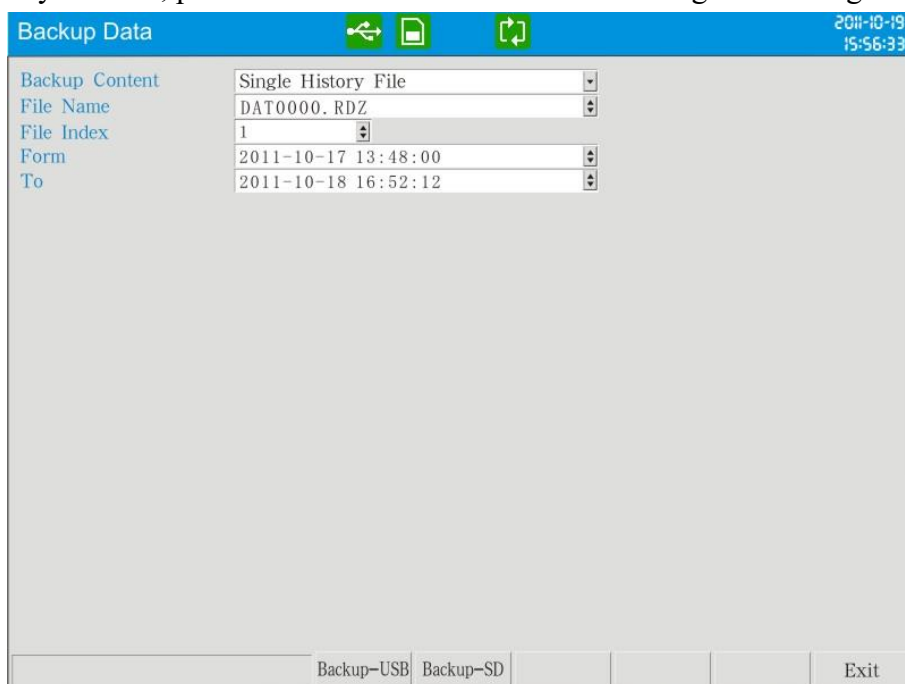

Procedures:
1. Properly connect U disk or SD card, then there is a corresponding connection icon display in the system column.
2. Use [up and down keys] to select the backup contents, including all historical data, historical data for single file, alarm recording, power-down record, the

system log, accumulative shift report,   the accumulative daily report, accumulative monthly and accumulative annual report.

3. When backing up historical data for single files, use the [up and down keys] to modify the file index, and make sure the backup start time and end time.

4. Modify the folder name or file name, use the [up and down keys] to adjust the file number, use the [Enter key] to edit the file name.

5. Back up data, move the cursor to 【Backup (USB)】 or 【Backup (SD)】 button, press [Enter key] to back up data.

6. Back up all the historical data, the file storage path is / DATA /】 【Device name】 / folder name; back up other data, the file storage path is / DATA / 【Device name】 / file name, for the 【Device name】, Please check the system configuration screen.

7. Use the [Page key] to return to data query screen.

4.11 data printing

This section describes how to use the mini-printer to print historical data.
On the way to display, please see the section 〖switching the running screen〗
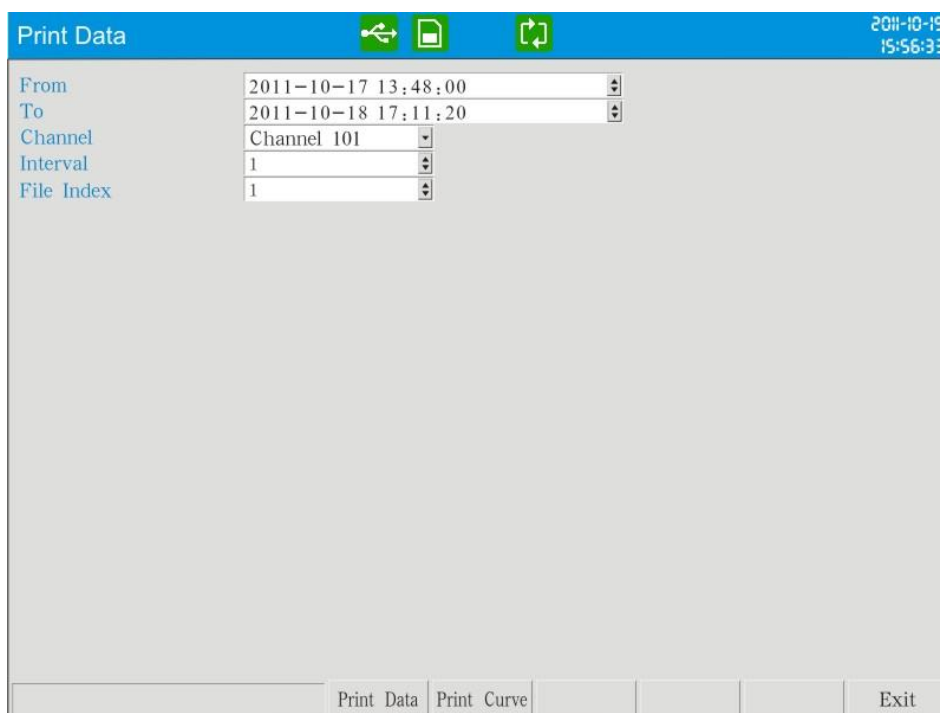
Steps:
1. Connect mini-printer properly.
2. Set the start time and end time.
3. Set print channel (or combination) and print interval.
4. Printing curves or data.
5. Use [Page] to return to data query screen.

Description

Connect the instrument and the printer through the special interface.

Instrument interface	Micro-printer interface
RXD	RTS
TXD	RXD
GND	GND

Instruments do not need to set the communication parameters.

4.12 alarm summary

Display channel alarm information and relay output state. It can save up to 256 pieces alarm information.

On the way to display, please see the section and 『switching the running screen』

1. Channel sequence number：Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.
2. Status: Displays the current record status, alarm, or report cancel
3. Channel: Displays the channels of current record
4. Alarm type. Display the alarm type. Figures represent the 4-way alarm in the number of (1-4), the letter on behalf of alarm type (H, L, I, D).
5. Alarm time. Displayed the alarm occur
6. Relay state. Display current relay output state.

Relay type	Normal open relay	Normal close relay
Green	open	close
Red	close	open

7. Menu: Use the [Enter key] to enter: Press [backup key] to the backup screen for the alarm record backup; Press [Exit] to return to the current alarm record screen.
8. Use [left or right button] or [up and down keys] to inquire next page
9. Use [Page] to return to data query screen

4.13 accumulative report

According to the related setting of report configuration and current query range, display accumulative report (yearly report+ monthly report+ daily report and monthly report+ shift report).

On the way to display, please see the section 〖switching the running screen〗

Operation instruction:

Channel: use the [Up and down keys] to modify the channel.

Type: Use the [Up and down keys] to select the display type of report combinations, and use the [Enter] key to start the query.

Time: Use the [Up and down keys] to select the time for report query.

Function keys: Press the [last month], or [the next month] to switch the month; press [backup] to skip to data backup screen for accumulative shift report backup; press [Print], using the mini-printer to print the screen display content; press [Exit] or [page] to return to the function screen.

4.14 power-down record

Display time of power-down and power-on records, including the power-down and power-on time, power-down frequency and the total time of power-down. It can save up to 512 power-down record.

On the way to display, please see the section 『switching the running screen』

Index	Power off	Power on
001	2011-10-17 12:40:04	2011-10-17 13:47:59
002	2011-10-17 08:29:34	2011-10-17 09:23:01
003	2011-10-17 08:29:06	2011-10-17 08:29:14
004	2011-10-14 17:56:03	2011-10-17 08:28:42
005	2011-10-11 17:37:51	2011-10-12 09:40:48
006	2011-10-11 15:42:19	2011-10-11 15:44:36
007	2011-10-11 15:11:24	2011-10-11 15:23:27
008	2011-10-11 15:02:59	2011-10-11 15:04:33
009	2011-10-11 14:50:17	2011-10-11 14:54:11
010	2011-10-11 14:35:16	2011-10-11 14:38:46
011	2011-10-11 14:24:43	2011-10-11 14:27:49
012	2011-10-11 12:05:35	2011-10-11 12:09:50
013	2011-10-11 11:35:25	2011-10-11 11:37:55
014	2011-10-11 11:27:44	2011-10-11 11:29:53
015	2011-10-11 11:16:12	2011-10-11 11:20:56
016	2011-10-11 11:02:51	2011-10-11 11:11:23
017	2011-10-11 10:47:25	2011-10-11 10:49:21
018	2011-10-11 10:37:48	2011-10-11 10:39:53
019	2011-10-11 10:17:18	2011-10-11 10:18:59
020	2011-10-11 10:06:53	2011-10-11 10:09:25
021	2011-10-10 19:25:49	2011-10-10 19:30:38
022	2011-10-10 18:52:29	2011-10-10 18:56:08
023	2011-10-10 18:45:36	2011-10-10 18:47:07
024	2011-10-10 18:34:24	2011-10-10 18:36:22

ShutDown:131Times/15d12h31m41s
Total:131   Exit

1. Channel sequence number：Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.
2. Power-down time: Power-down time of the Instrument.
3. Power-on time: power-on time of the Instrument.
4. Total power-down: the total number of power-down, accumulate each power-down time for display.
5. Menu: Use the [Enter key] to enter: Press [backup key] to the backup screen, for the power-down record backup; Press [Exit] to return to the current power-down record screen.
6. Use [left or right button] or [up and down keys] to inquire on next page
7. Use [Page] to return to data query screen.

4.15 system log
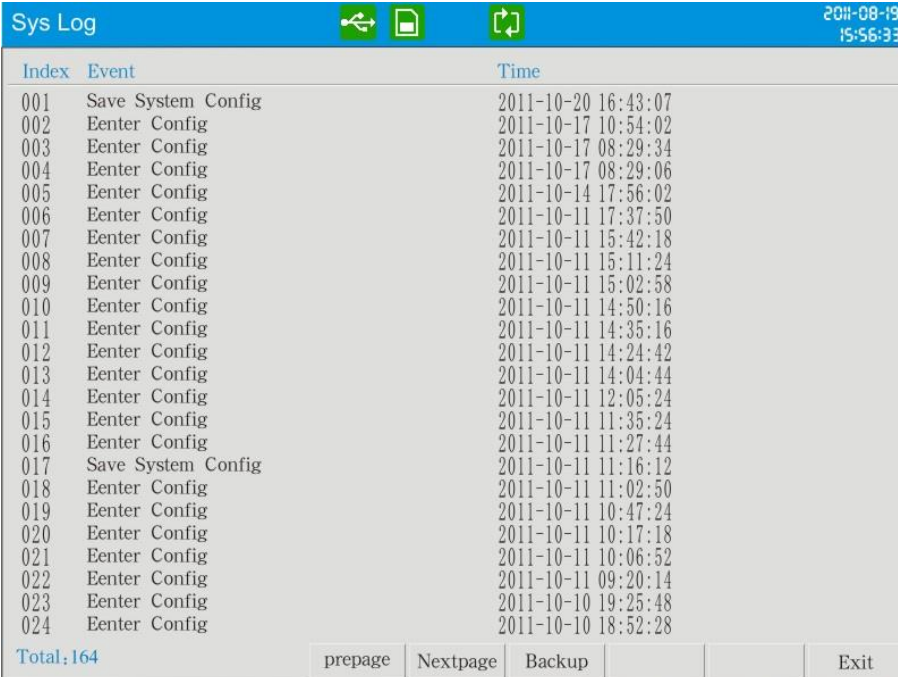
Display related log of instrument operation.
On the way to display, please see the section 〖switching the running screen〗

Operation:
Use [left and right button] or [up and down keys] to inquire on next page
Use [Page] to return to data query screen.

1. Channel sequence number：Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.
2. Event: Operation event.
3. Time of occurrence: The incident occurred.
4. Menu: Use the [Enter key] to enter: Press [backup key] to the backup screen,
5. For the system log backup; Press [Exit] to return to the current system log screen.

4.16 log configuration

This section describes how to log configuration.

Operation

Press the [next page] plus [En] to enter the login screen, enter the password, If the password is correct then display configuration entry, select the appropriate configuration entry to set the configuration; password error could not enter.
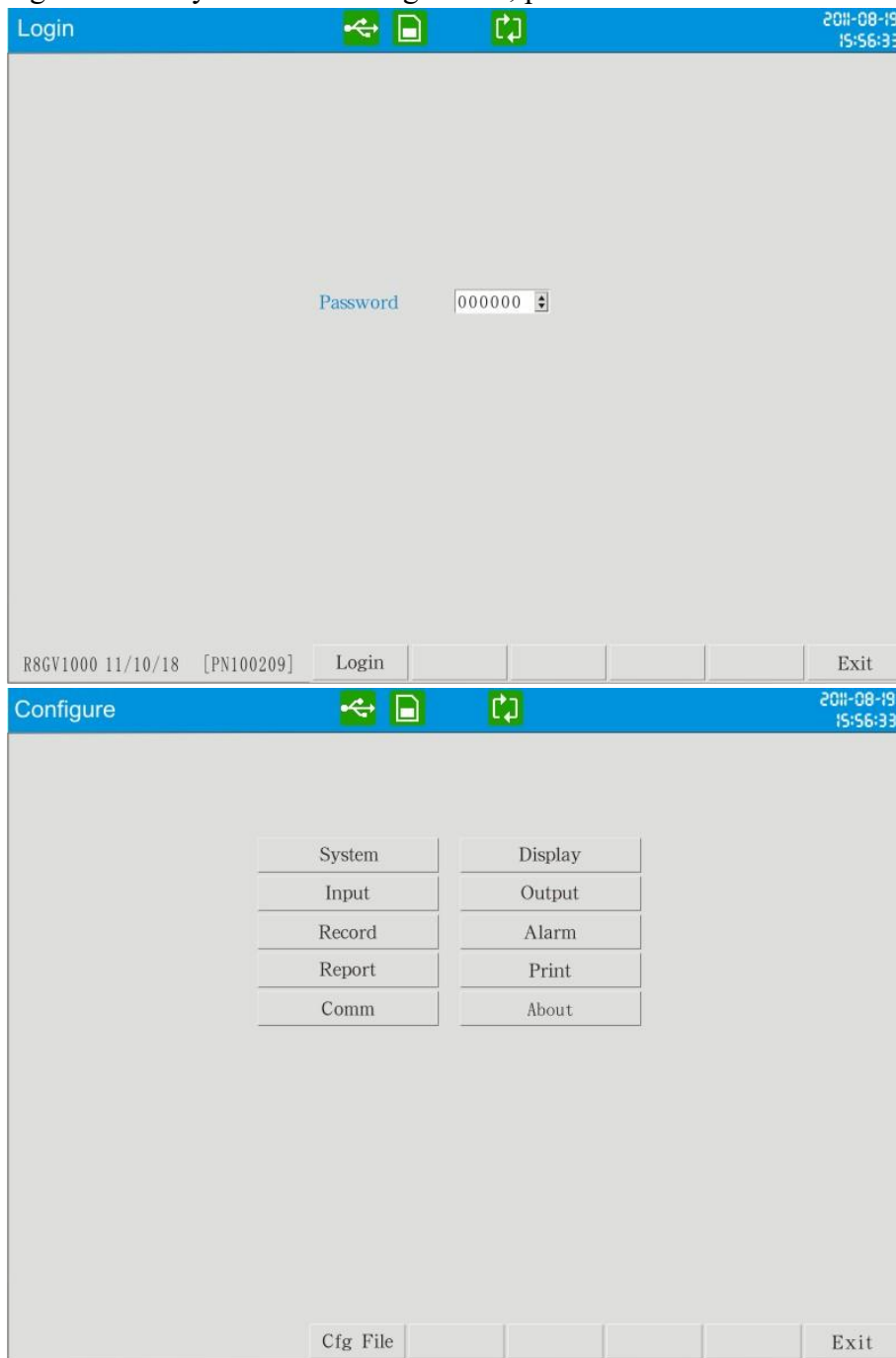
Press 【Quit】 button to exit configuration and enter the running screen.

CHAPTER 5 SYSTEM CONFIGURATIONS AND ITS FUNCTION

5.1 setting the date and time

Set the date and time of the instrument.

Procedure

Enter 【system configuration】 screen, the method to enter please see "log configuration".
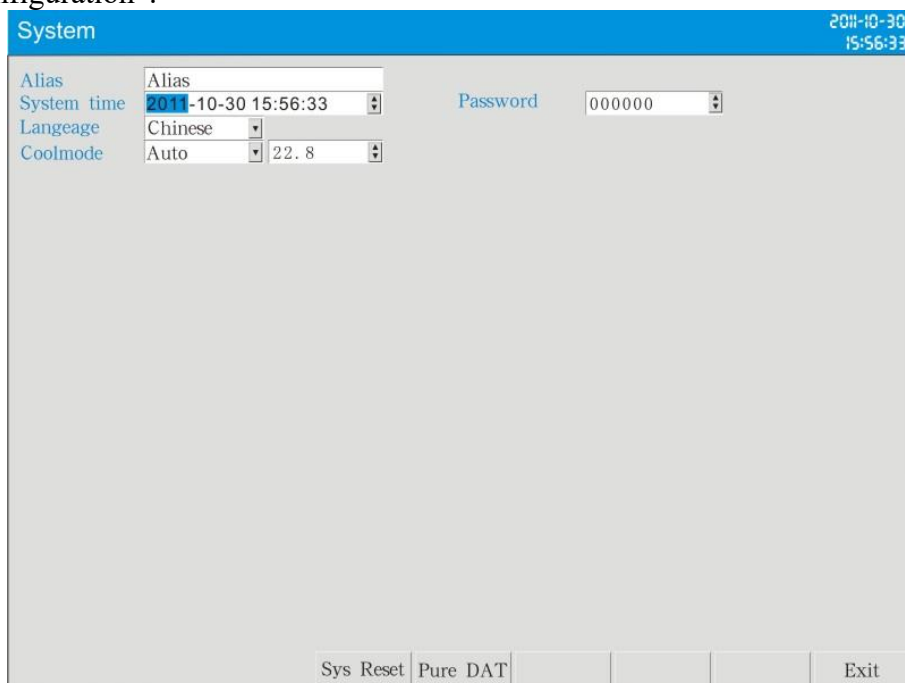
Date Time: This field is to set meter's current date and time.

1. Use the [left and right button] to move the cursor to the 【System time】 column.
2. Use the [up and down keys] to modify date and time.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cance】 to continue setting parameters in [System] screen.

Caution

After setting system date / time, those historical data stored in instrument is invalid.

New and effective data begins after setting system date / time.

Before setting system date / time, please back up history data.

After setting the system date / time, it is recommended that the instrument should purge the data.

5.2 setting the device name

Set the device name; display it on the title bar.
Use that name to create the directory of data backup and automatic backup .

Operation

Enter 【System configuration screen】, the method to enter please see "log configuration".

Device Name: This field is to set the device name.

1. Use the [left and right button] to move the cursor to the 【Alias】 column.
2. Use the [En] to input on the pop-up input panel, please refer to "common key operation" about the input method.
3. Confirming operation

    After the parameter setting, select 【Exit】 there is a Frame.

    Select 【Yes】 to save setting content, and exit [System] screen.

    Select 【No】 to cancel setting content, and exit [System] screen.

    Select 【Cancel】 to continue setting parameters in [System] screen.

5.3 setting the system password

System password is used to modify configuration parameters and prevent the system parameters from being accidentally modified.

System password is six digits.

Operation

Enter 【System configuration screen】 , the method to enter please see "log configuration".
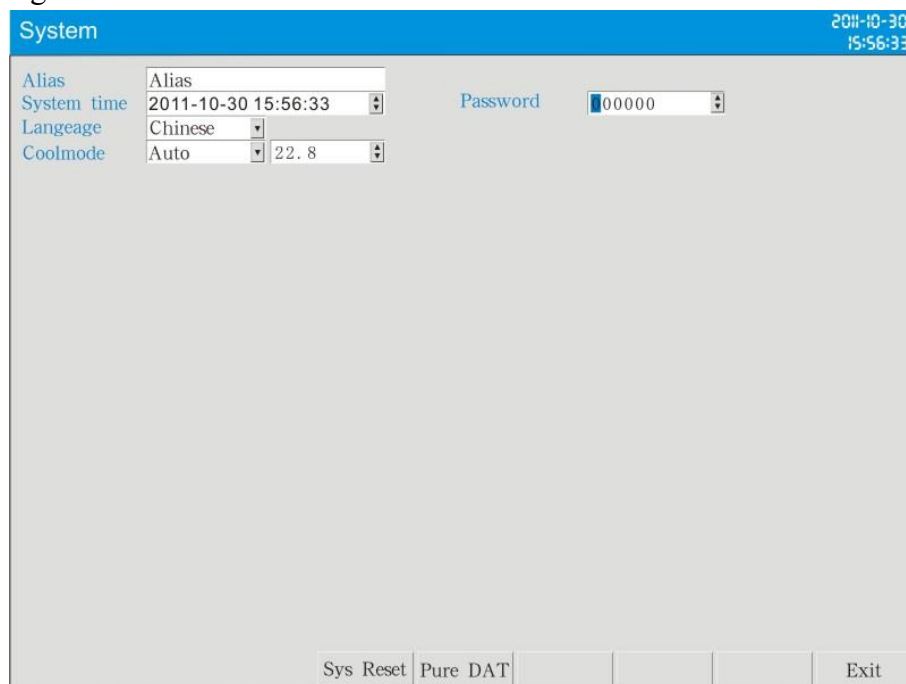
Password: This field is to set the system password.

1. Use the [left and right button] to move the cursor to the 【Password】 column.
2. Use the [up and down keys] to change password.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

NOTE

The system password is the only password which can enter the system configuration to modify parameters. If it is lost, modification is unavailable.

The initial password is 000000, after the purchase please change password as soon as possible, and properly preserve it.

5.4 set system language

Display language (Chinese and English).

Operation

Enter 【System configuration screen】, the method to enter please see "log configuration".
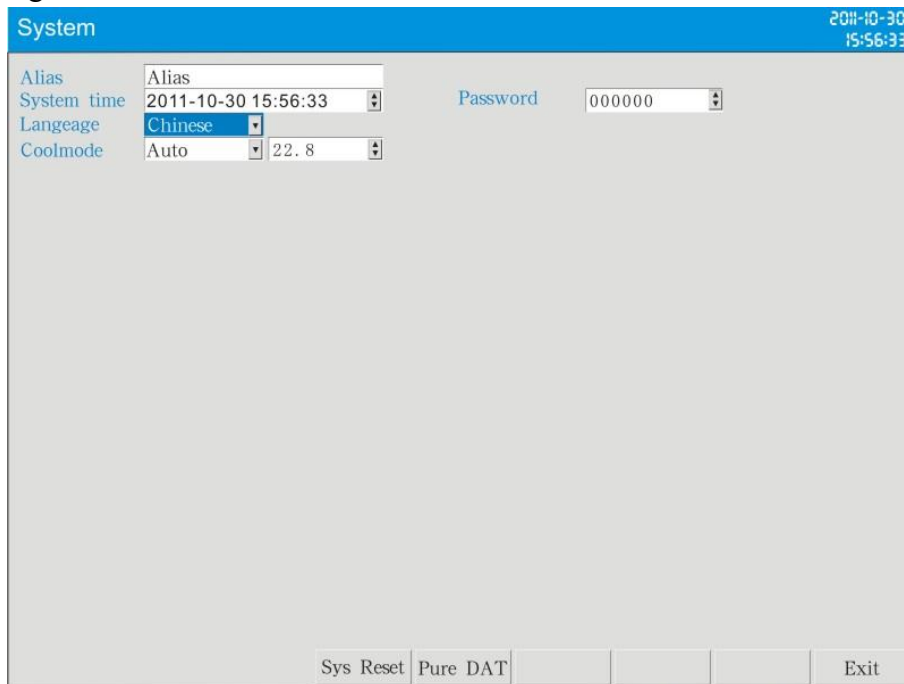
System Language: The bar is to set system language.

1. Use the [left and right button] to move the cursor to the 【Language】 column.
2. Use the [up and down keys] to select system language.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

5.5 set reference junction compensation

Reference junction compensation can tune compensation temperature value of thermocouple

Operation

Enter 【System configuration screen】, the method to enter please see "log configuration".
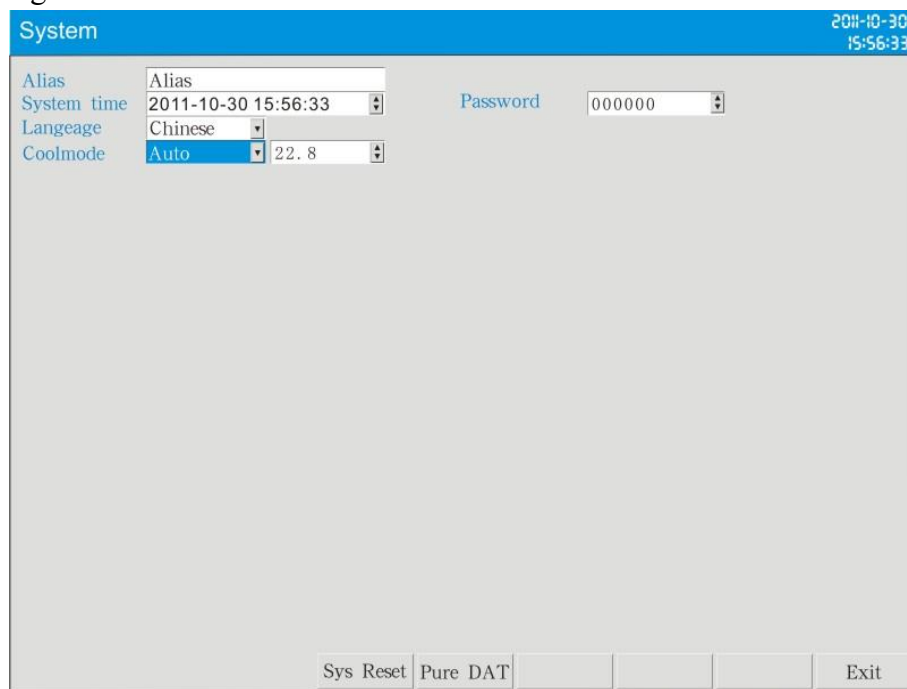
Cold-side adjustment: the column is used to set the Cold-side adjustment.

1. Use the [left and right button] to move the cursor to the 【RJC】 column.
2. Use the [up and down keys] to adjust the value of the cold side to the right temperature.
3. Confirming operation

    After the parameter setting, select 【Exit】 there is a Frame.

    Select 【Yes】 to save setting content, and exit [System] screen.

    Select 【No】 to cancel setting content, and exit [System] screen.

    Select 【Cancel】 to continue setting parameters in [System] screen.

5.6 implementation of the factory settings

This section describes the instrument functions of the factory settings and parameters of reset value.
This will clear all stored data in memory of the instrument, including historical data, the total cumulative amount, cumulative reports, alarm list, power-down records, but the system log is not cleared.

Operation

Enter 【System configuration screen】, the method to enter please see "log configuration".

1. Use the [F 1] to move the cursor to the 【Factory set】 button.
2. Use the [En] to implement factory setting function.
3. Pop up a confirmation dialog box.
   Select【Yes】, implement the factory settings.
   Select【Cancel】or【No】, give up the factory settings.

Reset instrument of configuration parameter values, please see the following table:

Configuration	##	Parameter	Reset value	Note
System Configuration	1	Device name	Device name / Alias	The former in Chinese, the latter in English
	2	Date and time	Not affected	No change
	3	System language	Not affected	No change
	4	Password	000000	
	5	RJC	0.0	Displayed as the cold-side plus adjustment
Display configuration	6	Background color	white	
	7	Screen brightness	10	
	8	Trend direction	Horizontal	
	9	First screen	Overview screen	
	10	Channel	None	
	11	Color	According to trend number	
Input configuration	12	Display tag	Channel xx / Channelxx	The former in Chinese, the latter in English
	13	Channel unit	%	
	14	Channel type	Current	
	15	Channel type	4-20mA	
	16	Channel precision	2	
	17	Signal range	4.00 ~ 20.00	
	18	Display range	0.00 ~100.00	
	19	Adjusted value K	1.00	
	20	Adjusted value B	0.00	
	21	Burnout treatment	-.--	
	22	Filter	0.0s	
	23	Small signal cutting	0.0%	
Output configuration	24	Channel	None	
	25	Adjusted value K	1.00	
	26	Adjusted value B	0.00	

	27	Record mode	Circular	
Record configuration	28	Record type	Real-time value	
	29	Record interval	2 s	
	30	Automatic backup	No	
	31	Trigger condition	Power-down	
Alarm configuration	32	Relay delay	4 s	
	33	Alarm hysteresis	0.00	
	34	I alarm time	1 s	
	35	R alarm time	1 s	
	36	Alarm type	None	
	37	Alarm value	0.00	
	38	relay	None	
Report configuration	39	Digit precision	2	
	40	Settle time	00:00	
	41	Number of shift report	3	
	42	Display tag	First shift Second shifr Third shift	
	43	Starting time	00:30~08:30 08:30~16:30 16:30~00:30	
	44	Accumulation	Close	
	45	Initial value of accumulation	0.00	
	46	Accumulative ratio	1.00	
Print configuration	47	Key printing	No	
	48	Timer print	No	
	49	Timer interval	00:02(H:M)	
	50	Print Blank	No	
	51	Print Type	All	
Communication configuration	52	Communication Address	001	
	53	Bytes exchange	2-1 4-3	
	54	Baudrate	115200	
	55	Parity	None	

5.7 implemention of purging data

This section describes the instrument functions of purging data.
Clear all stored data in memory of the instrument, including historical data, the total cumulative amount, cumulative reports, alarm list, power-down records, but the system log is not cleared.

Operation

Enter 【System configuration screen】 , the method to enter please see "log configuration".
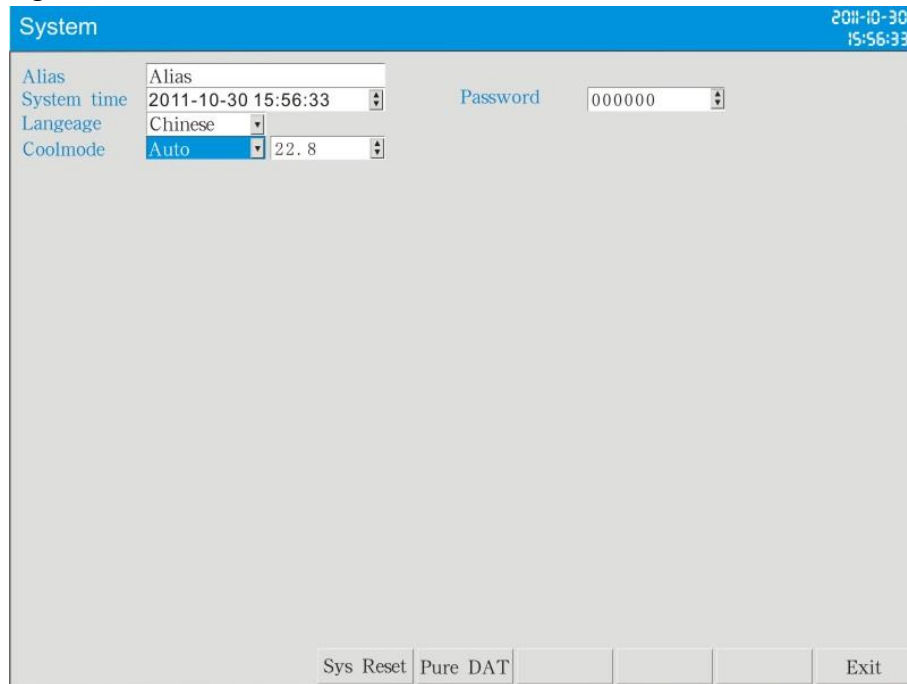
1. Use the [F2] to move the cursor to the 【Purge data】 button.
2. Use the [En] to clear data function.
3. Pop up a confirmation dialog box.
   Select【Yes】, implement data- clearing.
   Select【Cancel】or【No】, give up clearing data.

CHAPTER 6 SET RECORDS OF THE CONFIGURATION

6.1 set the record interval

This section describes the settings of historical data records interval. Optional recording interval: 1 second, 2 seconds, 5 seconds, 10 seconds, 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes, 30 minutes.

Operation

Enter 【record configuration screen】 ,the method to enter please see "log configuration".
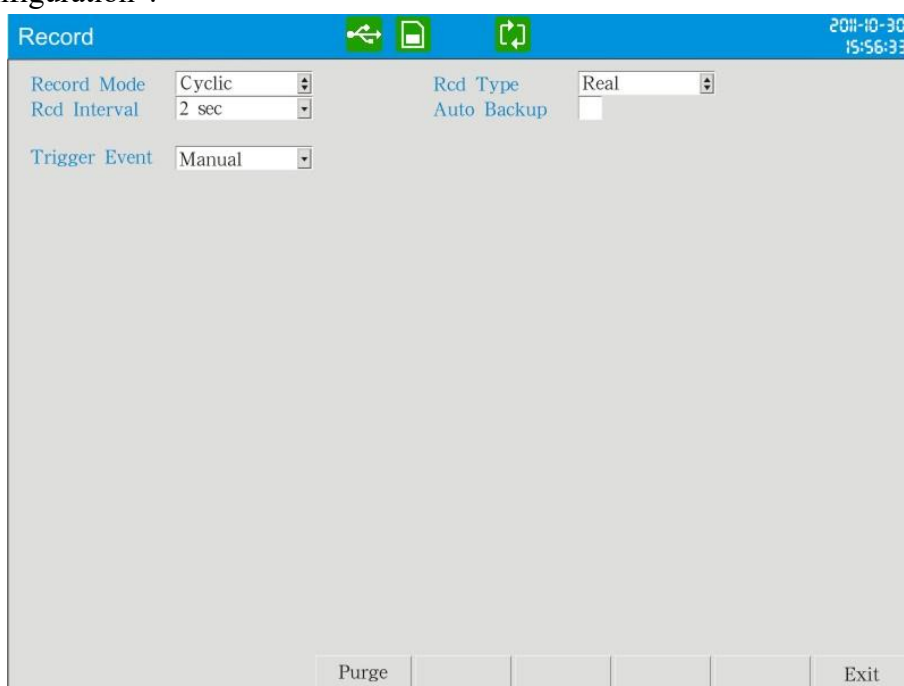
Record Interval: This field is used to set recorded interval

1. Use the [left and right button] to move the cursor to the 【Interval】 column.
2. Use the [up and down keys] to select record interval.
3. Confirming operation

    After the parameter setting, select 【Exit】 there is a Frame.

    Select 【Yes】 to save setting content, and exit [System] screen.

    Select 【No】 to cancel setting content, and exit [System] screen.

    Select 【Cancel】 to continue setting parameters in [System] screen.

<div align="center">NOTE</div>

After modifying the record interval, the record which is being stored in the instrument is invalid.

6.2 set up record type

This section describes setting and recording methods of historical data in the instrument.

When the recording interval is more than 1 second, depending on the recording method to select and calculate real-time value and record the calculated values.

Optional Recordings are: real-time values, average, maximum and minimum values.

 Real-time value: Direct take the records of time corresponding to real-time value.

 Average: take the average of real-time data before and after the recording points.

 Maximum: Take the maximum real-time value before and after the recording data points

 Minimum: Take the minimum real-time value before and after the recording data points

Operation:

 Enter 【Record configuration screen】 , the method to enter please see "log configuration".
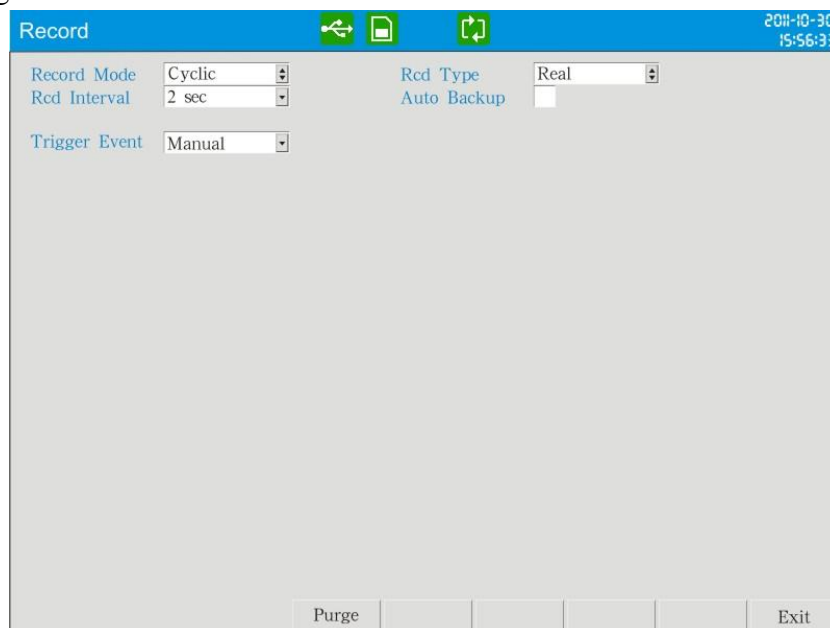
 Recording type: This column is used to set recording method. (It can choose real-time value, maximum value, minimum value, and average value)

1. Use the [left and right button] to move the cursor to the 【Record type】 column.
2. Use the [up and down keys] to select recording method.
3. Confirming operation

  After the parameter setting, select 【Exit】 there is a Frame.

  Select 【Yes】 to save setting content, and exit [System] screen.

  Select 【No】 to cancel setting content, and exit [System] screen.

  Select 【Cancel】 to continue setting parameters in [System] screen.

6.3 set up automatic backup

This section describes the principle and setting methods of historical data automatic backup.

Automatic backup: every day at 0:00 the instrument will automatically back up the history data to SD card; when stop recording or reach the trigger conditions set by the user, the instrument will automatically back up historical data to the SD card.
Automatic backup file storage directory:
1. Every day at 0:00   backup file storage directory: DATA / 【Device Name】/ instrument date (year _month) / AUTO_ date (day). RDZ
2. Other automated file storage directory: DATA /【Device Name】/ instrument date (month _year) / day / instrument time (hours _ minutes_ second). RDZ

Operation

Enter 【record configuration screen】 ,the method to enter please see "log configuration".
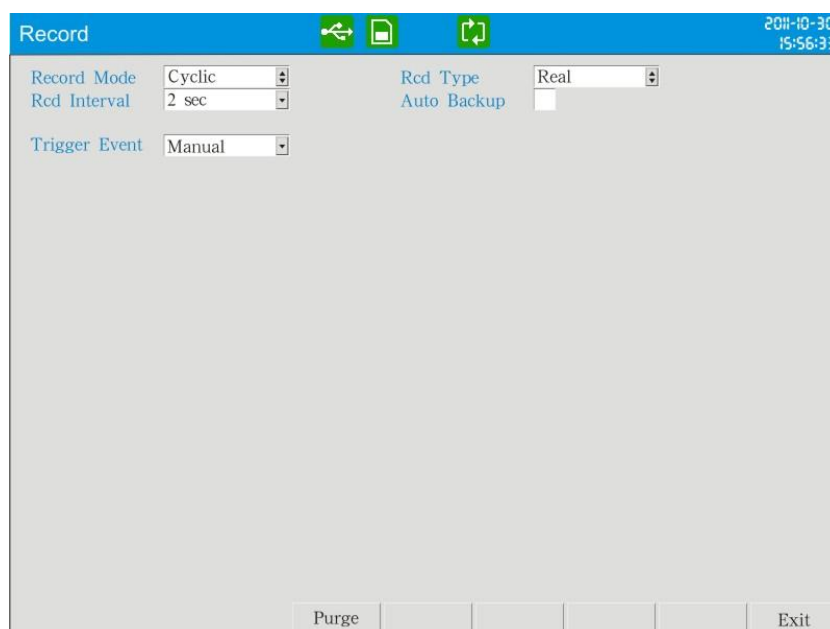
Automatic backup: The bar sets up automatic backups.

1. Use the [left and right button] to move the cursor to 【Auto backup】 column.
2. Use the [left and right keys] to open or turn off the automatic backup function.
3. Confirming operation
   After the parameter setting, select【Exit】there is a Frame.
   Select【Yes】to save setting content, and exit [System] screen.
   Select【No】to cancel setting content, and exit [System] screen.
   Select【Cancel】to continue setting parameters in [System] screen.

6.4 set record mode

This section describes the method of instrument record mode setting.

There are 2 types of recording modes: circular and non-circular.

Circular: When the record in the last file of the instrument is full, it will continue to record from the first file, the file will record historical data circularly according to the way in which the new file replaces the old.

Non-circular: When the instrument records at the last file is full, and then it will stop recording automatically

Operation

Enter 【Record configuration screen】 ,the method to enter please see "log configuration".
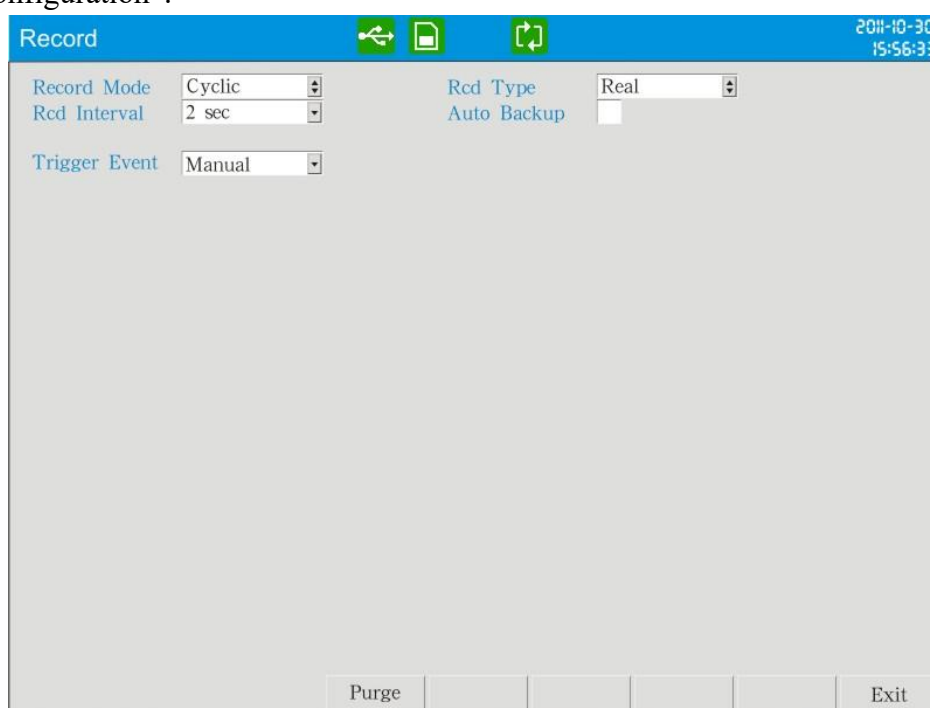
1. Use the [left and right button] to move the cursor to 【Record type】 column.
2. Use the [left and right keys] to select record type: circular or non-circular.
3. Confirming operation

    After the parameter setting, select【Exit】there is a Frame.

    Select【Yes】to save setting content, and exit [Configuration] screen.

    Select【No】to cancel setting content, and exit [Configuration] screen.

    Select【Cancel】to continue setting parameters in [Configuration] screen.

6.5 set trigger conditions

This section describes the method of trigger conditions setting.
Trigger conditions include: manual trigger, alarm, relay, switch, timing, power.
Manual: enter the instrument storage interface, you can manually start or stop   data storage recording.
Alarm: can be set only when one channel occurs alarm, then start recording data storage; when the alarm stops, then stop recording.
Relay: can be set only when one channel's alarm occurs, then start recording data storage; when the relay stops alarm, then stop recording.
Switch: Meter is connected to an external switch equipment, when the switch is on, the began recording data storage, and when switch is off , then stop recording data storage.
Timing: Timing cycles is fixed at 24 hours. Set start time and end time so that the instrument only records the data storage in the set time every day.
Power: when the instrument is powered on, it will automatically create a new file and start recording data.

Operation

Enter 【Record configuration screen】 ,the method to enter please see "log configuration".
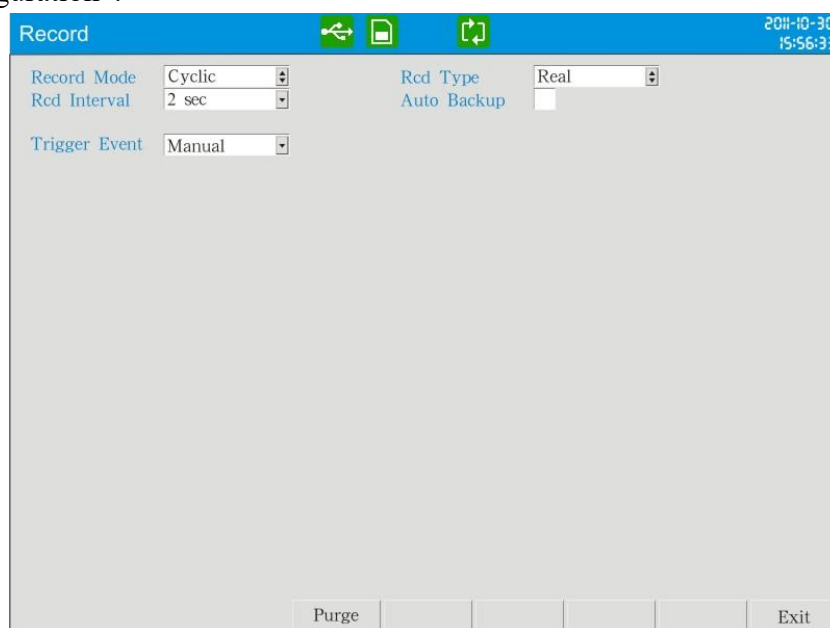
1. Use the [left and right button] to move the cursor to 【Trigger condition】 column.
2. Use the [up and down keys] to select trigger condition.
3. Confirming operation
   After the parameter setting, select [Exit] there is a Frame.
   Select 【Yes】 to save setting content, and exit [Configuration] screen.
   Select 【No】 to cancel setting content, and exit [Configuration] screen.
   Select 【Cancel】 to continue setting parameters in [Configuration] screen.

6.6 purge history data

This chapter describes the method for purging recording data.

It only purge the history data in the memory , the total accumulation, accumulative reports, alarm list, power-down record,but the system log is not cleared.

Operation

Enter 【Record configuration screen】 ,the method to enter please see "log configuration".
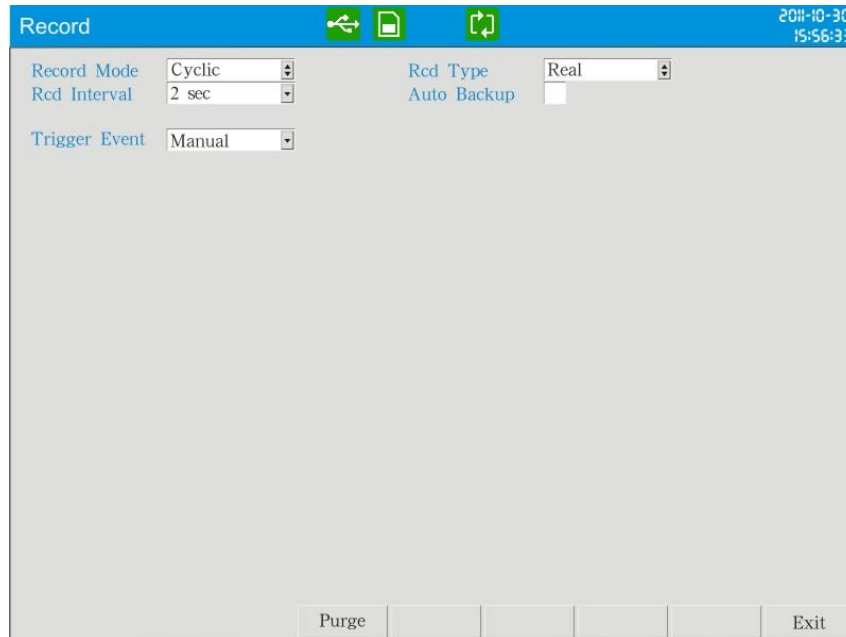
1. Use the [F1] to move the cursor to the 【Purge History record】 button.
2. Use the [Enter key] to purge the data function
3. Confirming operation

   Select 【Yes】 to purge data

   Select 【Cancel】 or 【No】 to give up purging data

CHAPTER 7 SET THE INPUT CONFIGURATION

This chapter describes the channel type, signal type, the relationship between the signal range and range display, and the computing part of the channel involved

Channel types and signal types

Channel types	Signal types	Calculation type
Current	0-20mA，4-20mA，0-10mA	Linear operation
Voltage	0-5V，1-5V，0-10V，20mV，100mV	Linear operation
Resistance	400Ω, 175Ω	Linear operation
Frequency	Fr	Linear operation
RTD	PT100，PT100.，Cu50，Cu53，BA1，BA2	No
Thermocouple	S，R，B，K，N，E，J，T，WRE5-26，WRE3-25，F1，F2	No
Ordinary vacuum	4-20mA，0-5V，1-5V，0-10V	Normal vacuum operation
Sub-vacuum	4-20mA，0-5V，1-5V，0-10V	Sub-vacuum operation
Digital	Voltage，Switch	Digital operation

Note: The thermal resistance and thermocouple signal range can not be changed; project quantity is the directly measured temperature.

- Linear operation

Semaphore transforms to project quantity according to the signal range and practical range of linear
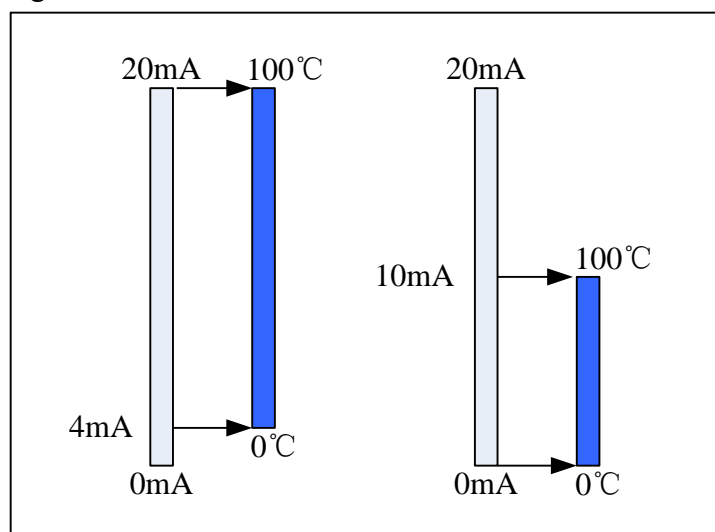
● Ordinary vacuum operation

Semaphores and vacuum degree of logarithm has a linear relationship, signal range in the overall signal is free to set, the project range is expressed by 10 of the index form, ranging from 10E-9.999 to 10E9.999.
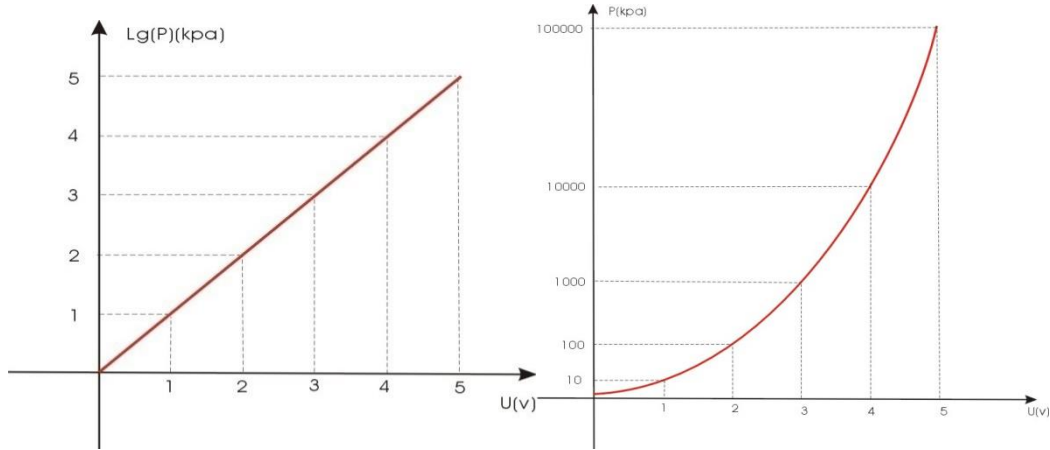
● Sub-vacuum operation

According to the vacuum degree of order , divide it into a number of sections , the corresponding signal of endpoint in   every section   and the vacuum degree has a linear relationship, at the same time, corresponding signal in the same section and the vacuum have   a linear relationship too. Signal range in the overall signal is free to set; the project range is expressed by 10 of the index form, ranging from 10E-9.999 to 10E9.999.
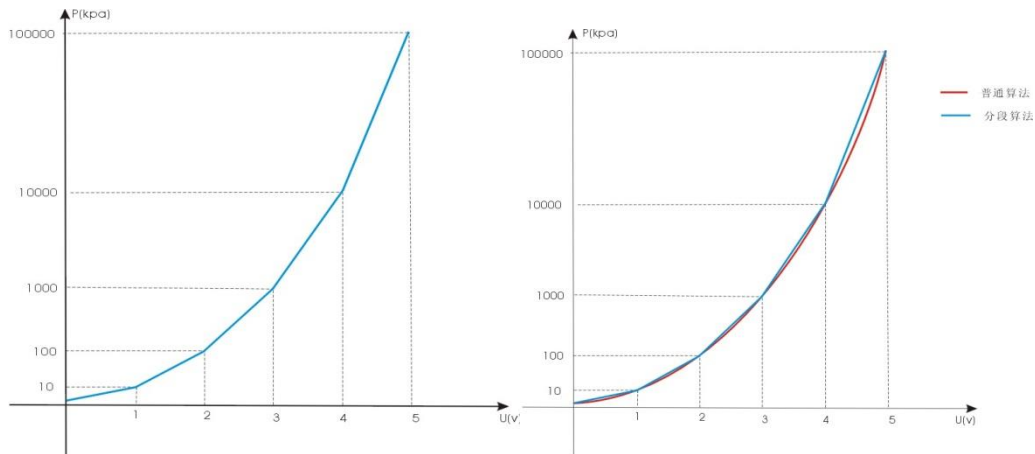
● Square root calculation

The percentage of the measured signal values need to have a square root calculation

$$50℃ = （100 - 0）* \sqrt{\frac{（8 - 4）}{（20 - 4）}} + 0$$

(Figure: bars showing 20mA/100℃, 8mA/50℃, 4mA/0℃ with square root operation)
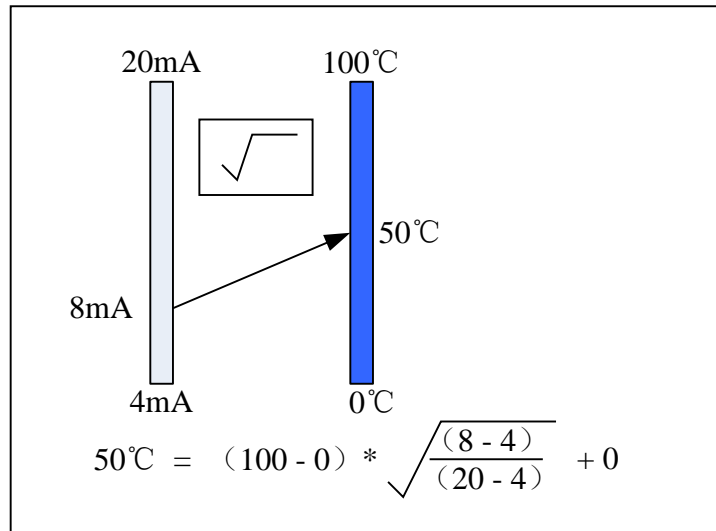
● Filtering operation

Filter parameters range from 0.0 seconds to 9.9 seconds .Take an example when the filter parameters is1.0 seconds

Previous collected data   S0 = 10mA
current collected data   S1 = 5mA

Filter parameter   1.0s

Result $\dfrac{f * S0 + S1}{1 + f}$

= 7.5mA
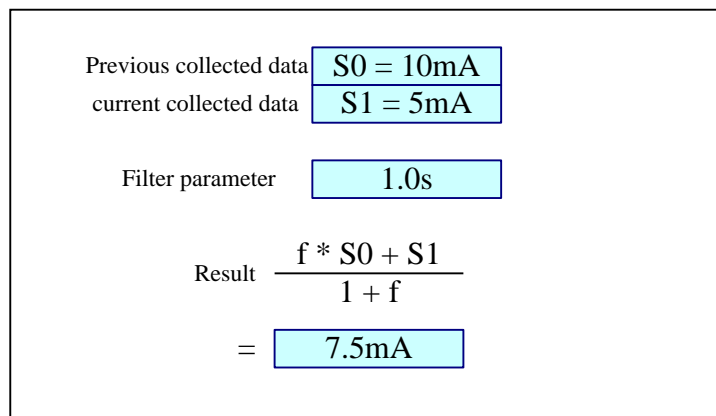
● Digital operation

Voltage: Access voltage signal: $0 \sim 0.8V$, displayed as 0; When $2V \sim 5V$, displayed as 1.

Switch: Access RTD signal: $0 \sim 80\,Ω$, displayed as 0; When $\geqslant 200\,Ω$, displayed as 1.

● Resection of the small-signal functions

less than the set value of the semaphore is zero, range: $0.0\% \sim 9.9\%$.

● Line Regulation

Quantities according to the formula $x = K * x + B$ linear adjustment.

● Burnout treatment,

The project quantity approach to deal with signal even break off, options are: maximum, minimum, to maintain the data, error markers, error markers. When choose error markers, collected data is the marked value.

● Reference Junction Compensation

reference junction compensation for thermocouple

Channel types and the computation relationship

	Reference junction compensation	Removal of small-signal	Filter	Square root	Specific calculation	Adjust linear	treatment of burnout
Current		●	●	●	Linear operation	●	●
voltage		●	●	●	Linear operation	●	●
Resistance			●		Linear operation	●	●
frequency		●	●		Linear operation	●	
Thermal Resistance			●			●	●
Thermocouple	●		●			●	●
Ordinary vacuum				●	General Vacuum		
Sub vacuum			●		Sub-vacuum		

● Tagging function is configurable function, and specific calculation can not be changed.

For current,burnout treatment is only used for 4-20mA signal,For voltage, it is only used for 1-5V signal.

Signal Type Measurement Range

Type	Range
0-20mA	-20mA ~ 20mA
4-20mA	4mA ~ 20mA
0-10mA	-10mA ~ 10mA
0-5V	-5V ~ 5V
1-5V	1V ~ 5V
0-10V	-10V ~ 10V
20mV	-20mV ~ 20mV
100mV	-100mV ~ 100mV
400Ω	0 ~ 400Ω
175Ω	0 ~ 175Ω
Fr	0 ~ 10KHz
Fr.	0.0~3000.0Hz
PT100	-200℃ ~ 650℃
PT100.	--50℃ ~ 150℃
Cu50	-50℃ ~ 150℃
Cu53	-50℃ ~ 150℃
BA1	-200℃ ~ 650℃
BA2	-200℃ ~ 650℃
S	-50℃ ~ 1768℃
R	-50℃ ~ 1768℃
B	250℃ ~ 1817℃
K	-200℃ ~ 1372℃
N	-200℃ ~ 1300℃
E	-200℃ ~ 1000℃
J	-210℃ ~ 1200℃
T	-200℃ ~ 385℃
WRE5-26	0℃ ~ 2310℃
WRE3-25	0℃ ~ 2310℃
F1	700℃ ~ 2000℃
F2	700℃ ~ 2000℃
Voltage	0（0V ~ 0.8V）, 1（2V ~ 5V）
Switch	0（200Ω ~ ∞）, 1（0 ~ 80Ω）

Note:
- Channel tag: 15 characters in length mixed in English and Chinese
- Channel unit: Not involved in operations, only display, 7 characters in length, support mixed English and Chinese symbols and special characters.
- Channel decimal point: The calculation and display precision, 0 to 3 decimals.
- Signal range: Within the entire range of signal, it is free to set signal acquisition range.
- Project Range: According to the project need, it is to be set free, -9999 ~ 30000, the decimal point 0 to 3.

7.1 set input type and scaling

This section describes the channel type and range setting method.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Channel close】, use the [up and down keys] to open or close the channel.
2. Use the [left and right button] to move the cursor to the 【Channel type】, use the [up and down keys] to select channel type.
3. Use the [left and right button] to move the cursor to the 【Signal type 】, use the [up and down keys] to select signal types.
4. Use the [left and right button] to move the cursor to the 【Precision】, use the [up and down keys] to adjust channel decimal point.
5. Use the [left button] to move the cursor to the 【Signal scale】, use the [En] to edit data, use the [up and down keys] to tune the data.
6. Use the [left and right button] to move the cursor to the【Display scale】, use the [En] to edit data, use the [up and down keys] to tune the data.
7. Confirming operation

   After the parameter setting, select【Exit】there is a Frame.

   Select【Yes】to save setting content, and exit [System] screen.

   Select【No】to cancel setting content, and exit [System] screen.

   Select【Cancel】to continue setting parameters in [System] screen.

   Note: The thermal resistance and thermocouple signal range cannot be changed.

7.2 set channel tag

This section describes how to set the channel tag.

Operation:

Enter 【Input configuration screen】,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Tag 】
2. Use the [En] to edit bit number.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

   Note: The channel tag, 15 characters in length, mixed in English and Chinese.

7.3 set the channel unit

This section describes how to set the channel engineering units.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Unit】.
2. Use the [up and down keys] to select a common unit.
3. Use the [En] to edit a custom unit.
4. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

Note: The channel unit is not involved in operations, only display, 7 characters in length, supporting mixed English and Chinese symbols and special characters.

7.4 set the channel adjustment

This section describes the channel linear adjustment.
Formula: project quantities= k × Quantities + b.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the linear 【Adjust(kX+b)】.
2. Use the [up and down keys] to tune data; use the [En] to edit data.
3. Confirming operation

After the parameter setting, select 【Exit】 there is a Frame.

Select 【Yes】 to save setting content, and exit [System] screen.

Select 【No】 to cancel setting content, and exit [System] screen.

Select 【Cancel】 to continue setting parameters in [System] screen.

7.5 set burnout treatment

This section describes how to deal with burnout. Burnout treatment is effective on the III type signal, thermal resistance and thermocouple signal.
Treatment methods: minimum, maximum, maintaining, -. -- (error flag).

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Burnout 】
2. Use the [up and down keys] to choose approach.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

7.6 set square root computations

This section describes set the square root computations of channels. To operational principle please see 『set the channel type and range』.

Operation:

Enter 【Input configuration screen】, the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to 【Channel type】
2. Use the [up and down keys] to choose the square root for the channel type.
3. Confirming operation

   After the parameter setting, select【Exit】there is a Frame.

   Select【Yes】to save setting content, and exit [System] screen.

   Select【No】to cancel setting content, and exit [System] screen.

   Select【Cancel】to continue setting parameters in [System] screen.

7.7 set the parameters of channel filter

This section describes the channel filtering settings. Setting theory of filtering operation please see 『6.1』 " channel types and range".

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Filter】.
2. Use the [up and down keys] to adjust the filter time parameter, ranging from 0.0 seconds ~ 9.9 seconds.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

7.8 set the removal of small signal

This section describes the setting of channel small-signal removal function. Resection of the small-signal operation principles please refer to 『6.1』 "set the channel type range".

Operation:

Enter 【Input configuration screen】,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Cut】.
2. Use the [up and down keys] to adjust removal, general signal is 0.0% ~ 9.9%, the frequency signal is frequency value: 0 ~ 99Hz.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

7.9 copy channel configuration

This section describes the channel configuration replication.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Channel】.
2. Use the [up and down keys] to select the source- channel.
3. Use the [F1] to execute 【Copy xx】 key, and copy the configuration parameter in the current channel.
4. Use the [up and down keys] to select the source channel.
5. Use the [F2] to execute 【Paste】 key, and copy the source channel configuration to the current channel configuration.

CHAPTER 8 SET OUTPUT CONFIGURATIONS

This chapter describes the principle and setting method of output transmission.
According to the source-channel project quantity and project range, to output a linear 4-20mA transmission,
Support the output kX + b adjustment, the source input channel can be set freely. Up to 8-channel can perform transmission output.

8.1 set the output channel

This section describes the setting method of transmission output channel.

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Channel】.
2. Use the [up and down keys] to select the output source channel or turn off the output.
3. Confirming operation

    After the parameter setting, select 【Exit】 there is a Frame.

    Select 【Yes】 to save setting content, and exit [System] screen.

    Select 【No】 to cancel setting content, and exit [System] screen.

    Select 【Cancel】 to continue setting parameters in [System] screen.

8.2 set the output adjustment

This section describes the setting methods of transmission output adjustment.

The formula: new output current = k × original output current+ b.

e.g

If the original channel scale is 0 ~ 100℃, and the current scale is 25℃, adjust K=2.00 and b = 3.00, then

Before adjusting, output = (25 / (100 - 0) * (20 – 4) + 4) mA = 8mA

After adjusting, output= = K × output + b = 2.00 * 8mA + 3.00 = 19mA

Operation:

Enter 【Input configuration screen】 ,the method to enter please see "log configuration".

Output				2011-08-19 15:56:33
	Channel		Adjust(kX+b)	
E1	OFF	÷	1.00	0.00
E2	OFF	÷	1.00	0.00
E3	OFF	÷	1.00	0.00
E4	OFF	÷	1.00	0.00
E5	OFF	÷	1.00	0.00
E6	OFF	÷	1.00	0.00
E7	OFF	÷	1.00	0.00
E8	OFF	÷	1.00	0.00
				Exit

1. Use the [left and right button] to move the cursor to the 【Channel】.
2. Use the [up and down keys] to tune data, and use [En] to edit data
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

CHAPTER 9 SET ALARM CONFIGURATION

This chapter describes the alarm principle, relay contacts and set methods.

The amount of channel project within a certain range of values performs alarm and relay output. Optional alarm types are: H, L, I, D. 4-way alarm for each channel.

- H Alarm:

When the project is greater than or equal to alarm value which has been set, alarm occurred. After alarm generated, the project is less than the amount or equal to (alarm value - hysteresis), then eliminate alarm.
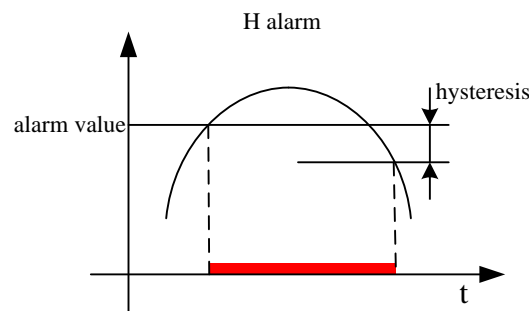
- L Alarm:

When the project is less than the amount equal to the alarm value, the alarm occurred. After alarm generated, the project is greater than or equal to (alarm value + hysteresis), then eliminate alarm.
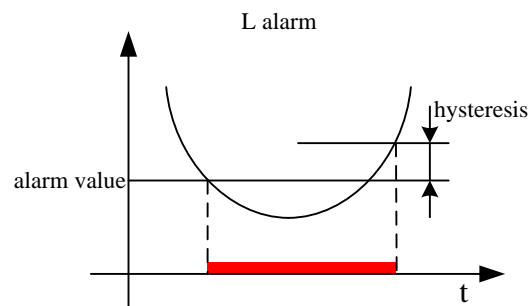
- I alarm:

The project difference (V2 - V1) of a specific time interval point (t2 and t1) is greater than or equal to alarm value which has been set, alarm occurred.
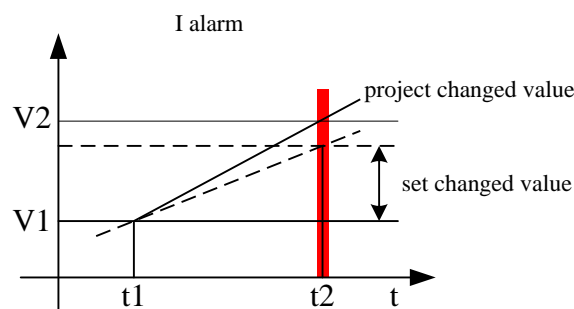
● D Alarm:

The project difference (V2 - V1) of a specific time interval point (t2 and t1) is greater than or equal to alarm value which has been set, alarm occurred.
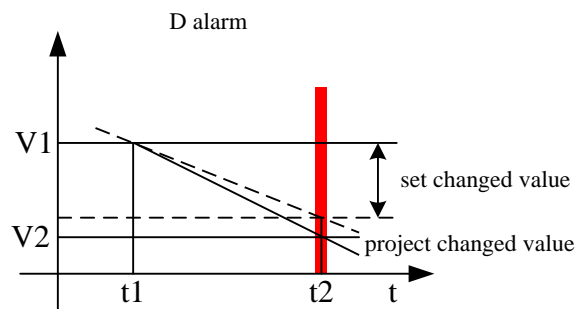
D alarm

- Relay Delay: Relay delay time after the occurrence of an alarm, 0-10 seconds (optional). (Valid for all alarms)
- Hysteresis: hysteresis range of H/L's eliminating alarms (All channels is uniform)
- I Alarm Time: Alarm interval time of I. (All channels is uniform)
- D Alarm Time: Alarm interval time of D.v (All channels is uniform)
- Relay Output: corresponding relay to alarm. Optional 1-12 or 1-8, when multiple alarms use the same one relay output, Use the stack output.
- Each alarm action and eliminating actions will have reported alarm information to form a warning list. The maximum of alarm list is 256.

9.1 set the alarm and relay contract

This section describes the setting methods of alarm parameters and relay contacts.

Operation:

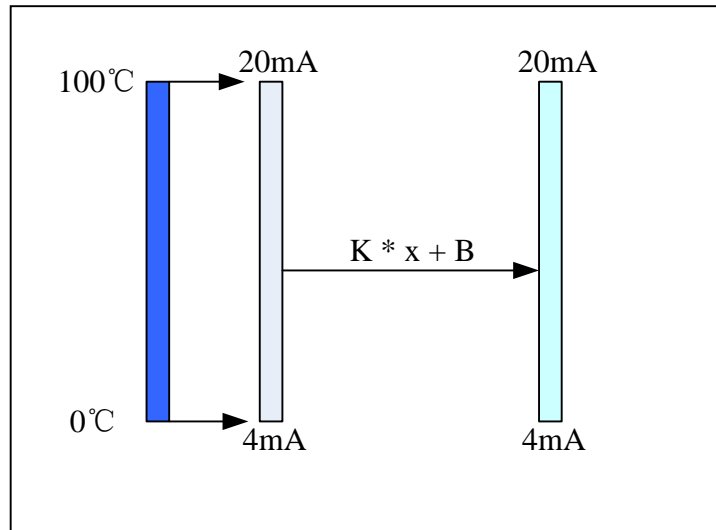Enter 【Alarm configuration screen】 ,the method to enter please see "log configuration".

1. Use [left and right button] to move the cursor to the 【Channel】 ,use the [up and down keys] to select channel configuration.
2. Use the [left and right button] to move the cursor to the 【Type】 , use the [up and down keys] to select alarm type and shut down alarm.
3. Use the [left and right button] to move the cursor to the 【Alarm value】 , use the [up and down keys] tune data; use the [En] to edit data.
4. Use the [left and right button] to move the cursor to the 【Relay】 ,use the [up and down keys] to select relay contact number, OFF stands for closure; R1 ~ 12 stands for the corresponding relay output.
5. Confirming operation

   Press [F6] to execute 【Exit】 , and select [Exit] there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

9.2 set the delay period of relay output

This section describes the time delay settings method of relay.

Operation:

Enter 【Alarm configuration screen】 ,the method to enter please see "log configuration".

1. Use [left and right button] to move the cursor to the 【Relay delay】.
2. Use the [up and down keys] to adjust the output delay time, ranging from 0 to 10 seconds.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

9.3 set the hysteresis of alarm limit

This section describes the setting method of hysteresis of alarm limit; hysteresis parameters are only valid for HL alarm.

Operation:

Enter 【Alarm configuration screen】,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【Hysteresis】.
2. Use the [up and down keys] tune data; use the [En] to edit data.
3. Confirming operation

   After the parameter setting, select 【Exit】there is a Frame.

   Select 【Yes】to save setting content, and exit [System] screen.

   Select 【No】to cancel setting content, and exit [System] screen.

   Select 【Cancel】to continue setting parameters in [System] screen.

9.4 set the variation of alarm time

This section describes setting method of the changes in the amount of alarm hysteresis. Incremental alarm periods is effective to I alarm, reduced alarm time is effective to D alarm.

Operation:

Enter 【Alarm configuration screen】,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【I Alarm Time】, use the [up and down keys] to adjust the alarm time, the scope is 1 ~ 32 seconds.
2. Use the [left and right button] to move the cursor to the 【Reduced Alarm Time】, use the [up and down keys] to adjust the alarm time, the scope is 1 ~ 32 seconds.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

CHAPTER 10 SET THE DISPLAY CONFIGURATION

This chapter describes the applications of channel combination.

According to the channel combinations, Digital display screen, Bar graph screen, real-time curve screen and the historical curve screen have data or curves display; default settings without channel combinations, digital screen and bar diagram show in full-screen channel, real-time curve screen and the historical curve screen are in accordance with 4-way channel to display as a set of cycles. Details please refer to the screen description.

10.1 set background color

This section describes the background color setting method of digital display screen and bar graph.

Operation

Enter the 【Display configuration】 screen , For the methods to enter, please refer to the section 〖 log configuration〗 .
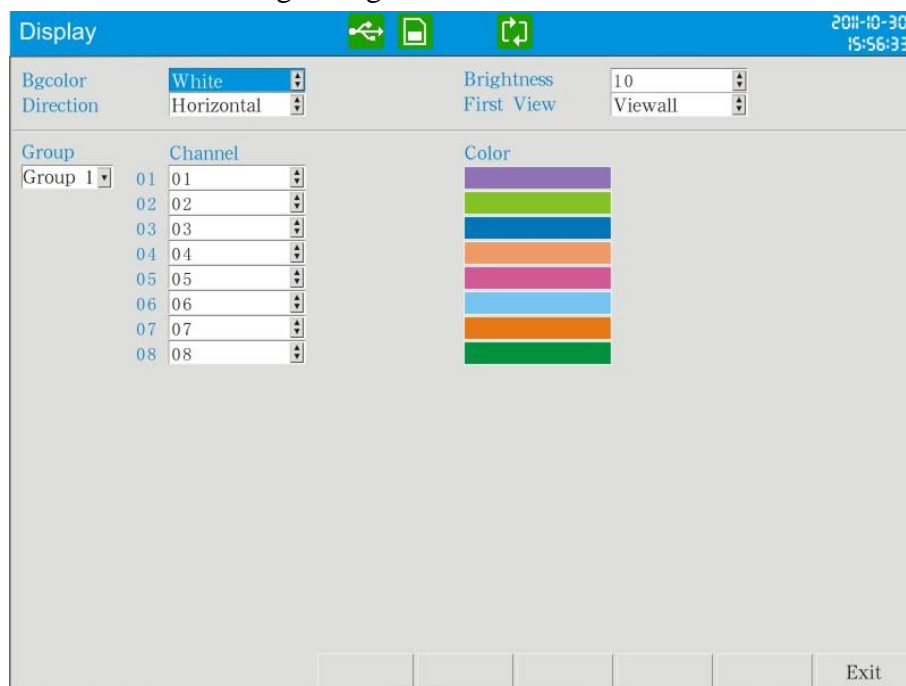
1. Use the [left and right button] to move the cursor to the 【Background color】.
2. Use the [up and down keys] to select direction: white or black;
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [Configuration] screen.

   Select 【No】 to cancel setting content, and exit [Configuration] screen.

   Select 【Cancel】 to continue setting parameters in [Configuration] screen.

10.2 set screen brightness and first screen

This section describes the setting method of the startup screen brightness and the first screen display when the instrument starts.

Operation

Enter the 【Display configuration】 screen , For the methods to enter, please refer to the section 〖 log configuration〗 .
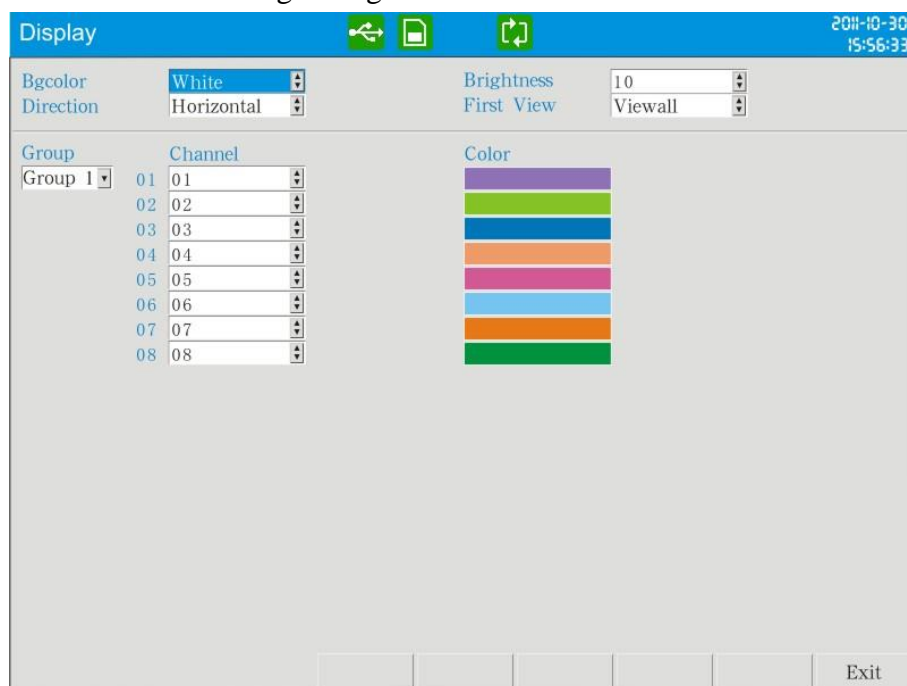
1. Use the [left and right button] to move the cursor to the 【Screen brightness】, and use the [up and down keys] to adjust the screen brightness, range from 0 to 10.
2. Use the [left and right button] to move the cursor to the 【The first screen】, and use [the up and down keys] to select the first screen display when the meter starts.
3. Confirming operation

    After the parameter setting, select 【Exit】 there is a Frame.

    Select 【Yes】 to save setting content, and exit [Configuration] screen.

    Select 【No】 to cancel setting content, and exit [Configuration] screen.

    Select 【Cancel】 to continue setting parameters in [Configuration] screen.

10.3 set the direction of curves on the paper

This section describes the setting method of curve direction on the paper.

Operation

Enter the 【Display configuration】 screen , For the methods to enter, please refer to the section 『 log configuration』 .
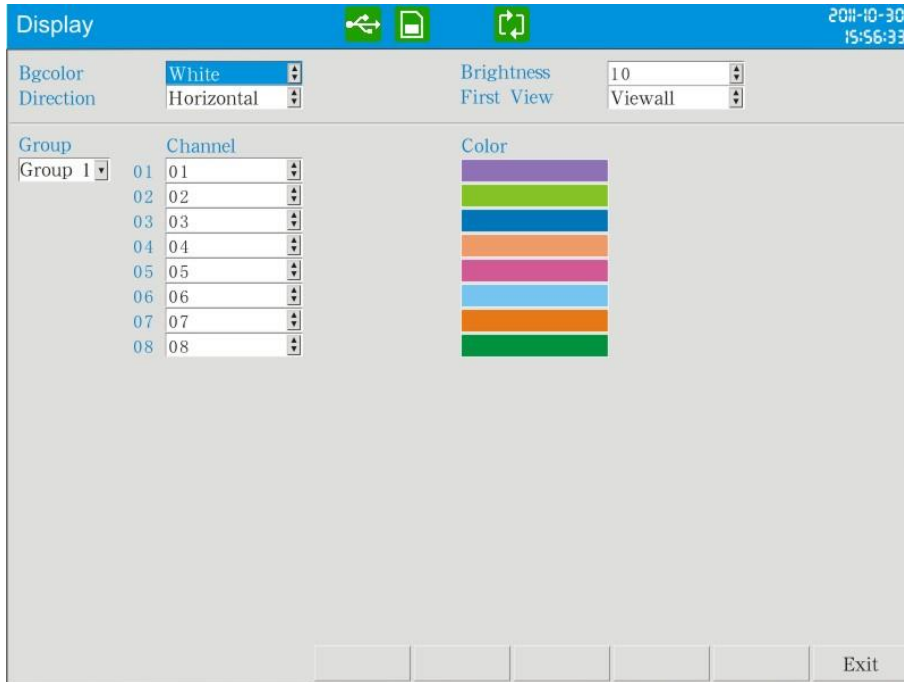
1. Use the [left and right button] to move the cursor to the 【Direction】.
2. Use the [up and down keys] to choose the direction, horizontal or vertical (optional).
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

10.4 set the combination and color of the channels

This section describes the setting methods of combination of channels.

Operation

Enter the 【Display configuration】 screen , For the methods to enter, please refer to the section 『 log configuration』 .
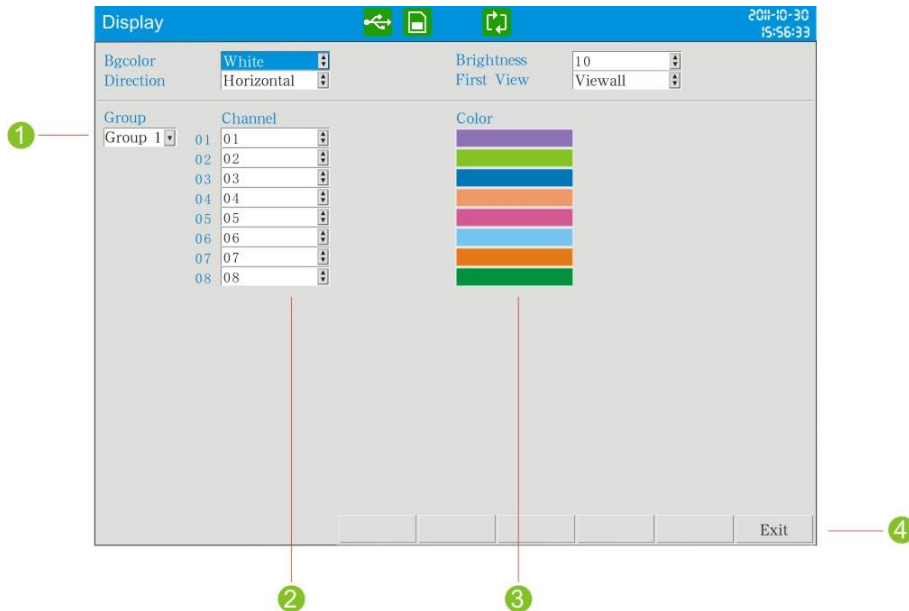
1. Use the [left and right button] to move the cursor to the 【Group】, use the [up and down keys] to choose serial number.
2. Use the [left button] to move the cursor to the 【Channel】, use the [up and down keys] to select open or close channel.
3. Use the [left and right button] to move the cursor to the 【Color】, optional colors: red, green, blue, yellow, blue, purple.Use the [up and down keys] to select channel color.
4. Confirming operation
   After the parameter setting, select【Exit】there is a Frame.
   Select【Yes】to save setting content, and exit [System] screen.
   Select【No】to cancel setting content, and exit [System] screen.
   Select【Cancel】to continue setting parameters in [System] screen.

CHAPTER 11 SET REPORT CONFIGURATION

11.1 set channel accumulation, initial value,magnification, decimal digits

This section describes the setting method of cumulative channel, the cumulative initial value, cumulative magnification and settling time.
Accumulative Initial value: initial value of accumulation begins to accumulate.
Accumulative Rate: According to the normal rate of a cumulative accumulation to multiply.
Purge accumulation: Clear the accumulated amount of the current channel.
Decimal digits: set the decimal digits for the accumulative value of all channels.
Settle time: from the setting settler time to the next one, which can be regarded as one day accumulation when starting the accumulation function.

Operation:

Enter 【Report configuration screen】,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to the 【decimal digits】., use the [up and down keys] to adjust, range from 0 to 2.
2. Use the [left and right button] to move the cursor to the 【Settle time】 , use the [up and down keys] to adjust settle time, range from 00 to 23.
3. Use the [left and right button] to move the cursor to the 【Channel 】. Use the [up and down keys] to select the channel.
4. Use the [left and left button] to move the cursor to 【Accumulation】. Use the [up and down keys] to select to open or close the accumulative function.

5. Use the [left and right button] to move the cursor to the 【Initial 】, use the [up and down keys] to tune data, use the [En] to edit data, ranging from 0 to 999999.00.

6. Use the [left and right button] to move the cursor to the 【Magnification】, use the [up and down keys] to tune data, use the [En] to edit data, ranging from 0.00 ~ 999999.00.

7. Confirming operation

    After the parameter setting, select 【Exit】 there is a Frame.

    Select 【Yes】 to save setting content, and exit [System] screen.

    Select 【No】 to cancel setting content, and exit [System] screen.

    Select 【Cancel】 to continue setting parameters in [System] screen.

11.2 set shift reports, time and display number

This section describes the number of shift reports and time and setting methods.
The number of shift report: the number of classes per day, range from 2 to 5.
Shift: start time and end time of every class, 24-hour clock.

Operation:

Enter 【Report configuration screen】 ,the method to enter please see "log configuration".

1. Use the [left and right button] to move the cursor to 【Shift number】, use the [up and down keys] to choose the number of shift reports, five shifts are the largest.
2. Use the [left and right button] to move the cursor to the 【Display number】, and use the Enter button to edit the shift report to show the display number.
3. Use the [left and right button] to move the cursor to the 【Start time】, use the [up and down keys] to adjust the frequency of time.
4. Confirming operation

   After the parameter setting, select【Exit】there is a Frame.

   Select【Yes】to save setting content, and exit [System] screen.

   Select【No】to cancel setting content, and exit [System] screen.

   Select【Cancel】to continue setting parameters in [System] screen.

CHAPTER 12 SET PRINTING CONFIGURATION

12.1 set printing configuration

This section describes settings methods of key trigger print, timer print, print blank and print type.

Operation:

Enter【Print configuration screen】,the method to enter please see "log configuration".

Use the [left and right button] to move the cursor to choose printing functions, use the [up and down keys] to open or close button printing functions.
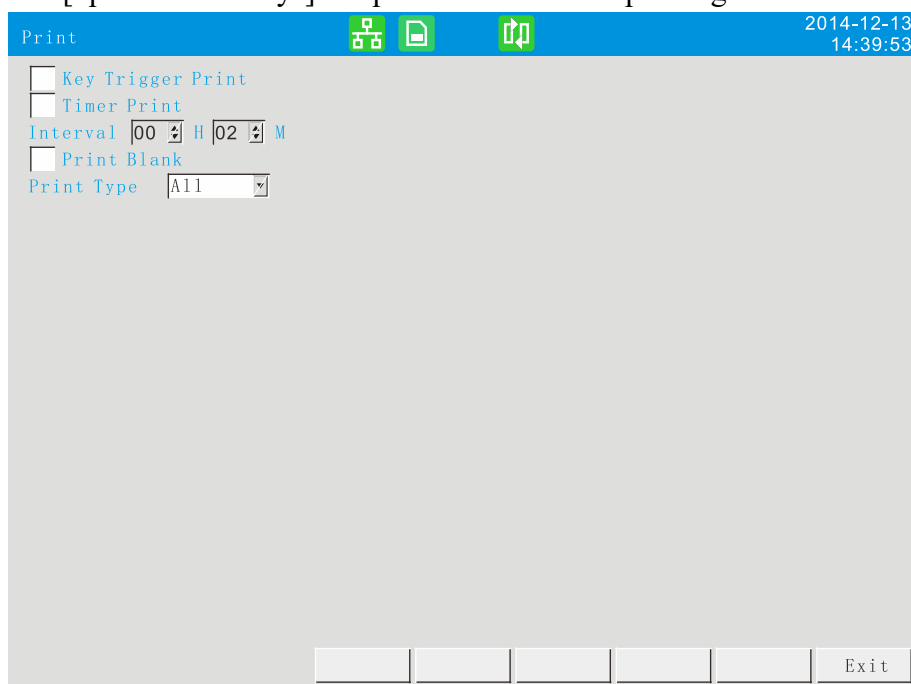
1. Key Trigger Print: In the digital display screen, Bar graph screen, real-time curve screen, using the [Left] to trigger button printing, and then print the real-time data and cumulative amount.
2. Timer Print: each day, choose O: 00:00 as the starting time and print real-time data and accumulation according to time intervals.
3. Interval: Use the [up and down keys] to adjust the print interval time in the format X/hour, X/minute.
4. Print Blank: After it is turned on, an additional blank will be printed to ensure that the paper at the printer outlet contains all printed data.
5. Print Type: adjust the print type: All, Value and Accu.
6. Confirming operation
   After the parameter setting, select 【Exit】 there is a Frame.
   Select 【Yes】to save setting content, and exit [System] screen.
   Select 【No】to cancel setting content, and exit [System] screen.
   Select 【Cancel】 to continue setting parameters in [System] screen.

CHAPTER 13 SET COMMUNICATIONS CONFIGURATION

13.1 set address

This section describes the setting method of ModbusRTU mailing address.

Operation:

Enter 【Communication configuration screen】 ,the method to enter please see "log configuration".
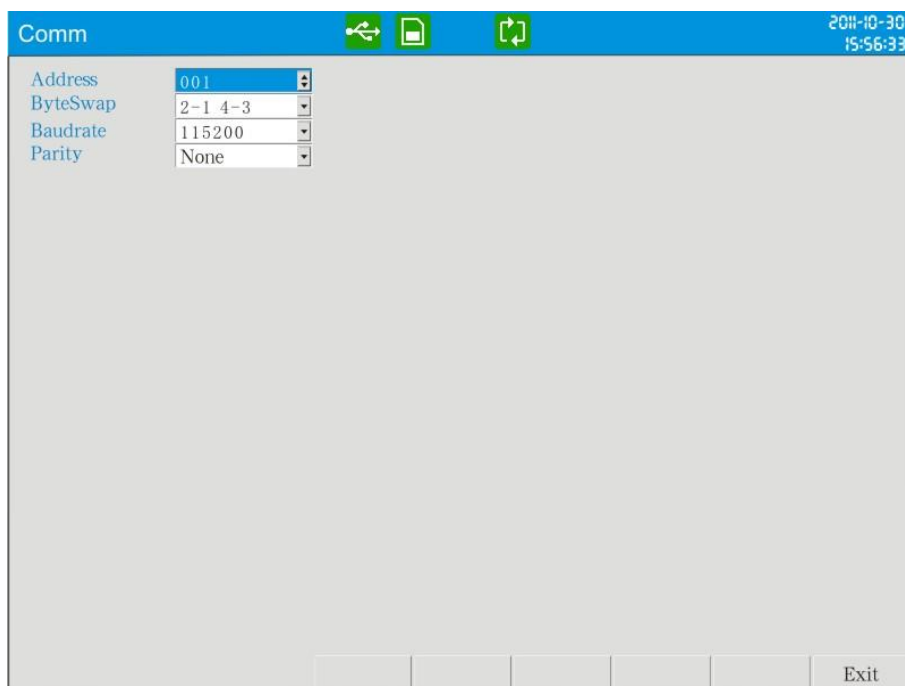
1. Use the [left and right button] to move the cursor to the 【Address】 .
2. Use the [up and down keys] to modify the mailing address, ranging from 0 to 247.
3. Confirming operation

    After the parameter setting, select 【Exit】 there is a Frame.

    Select 【Yes】 to save setting content, and exit [System] screen.

    Select 【No】 to cancel setting content, and exit [System] screen.

    Select 【Cancel】 to continue setting parameters in [System] screen.

13.2 set communication baud rate

This section describes the setting method of serial communication baud rate.
Baud rate: 1200,2400,4800,9600,19200,38400,57600,115200. The default value is
115200.

Operation:

Enter 【Communication configuration screen】 ,the method to enter please see
"log configuration".
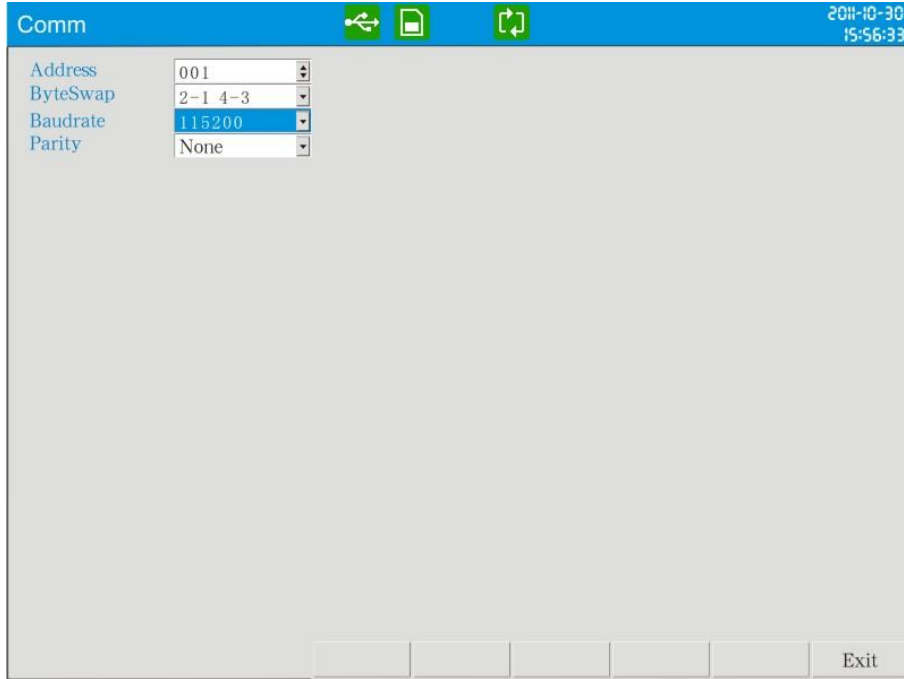
1. Use the [left and right button] to move the cursor to the 【Baud rate】.
2. Use the [up and down keys] to select communication baud rate.
3. Confirming operation

   After the parameter setting, select 【Exit】 there is a Frame.

   Select 【Yes】 to save setting content, and exit [System] screen.

   Select 【No】 to cancel setting content, and exit [System] screen.

   Select 【Cancel】 to continue setting parameters in [System] screen.

13.3 set communication check

This section describes the setting method of serial communication check.
Parity: no parity, odd parity, even parity.
The default value is no check

Operation:

    Enter 【Communication configuration screen】 ,the method to enter please see "log configuration".
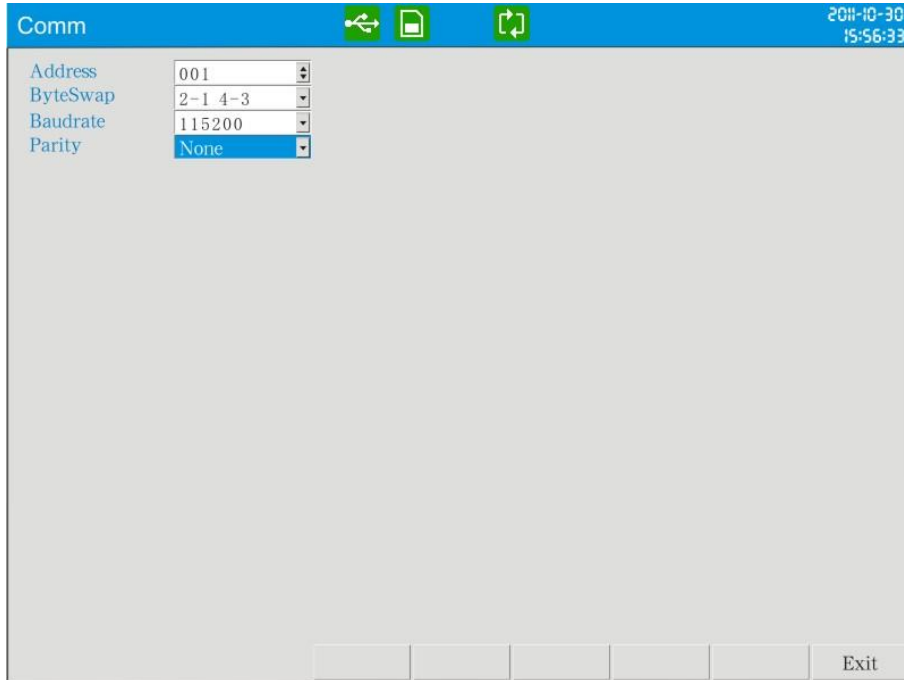
1. Use the [left button] to move the cursor to the 【Parity】 .
2. Use the [up and down keys] to Select check method.
3. Confirming operation
   After the parameter setting, select【Exit】there is a Frame.
   Select【Yes】to save setting content, and exit [System] screen.
   Select【No】to cancel setting content, and exit [System] screen.
   Select【Cancel】to continue setting parameters in [System] screen.

13.4 set the order of byte-swapping

This section describes the setting method of ModbusRTU 32-bit data byte-swapping. In order to be suitable for ModbusRTU communication protocol, it provides byte-swapping functions.

Byte-swapping: 1-2, 3-4, 2-1 4-3, 3-4 1-2, 4-3 2-1. The default value is 2-14-3.

Operation:

Enter 【Communication configuration screen】 ,the method to enter please see "log configuration".
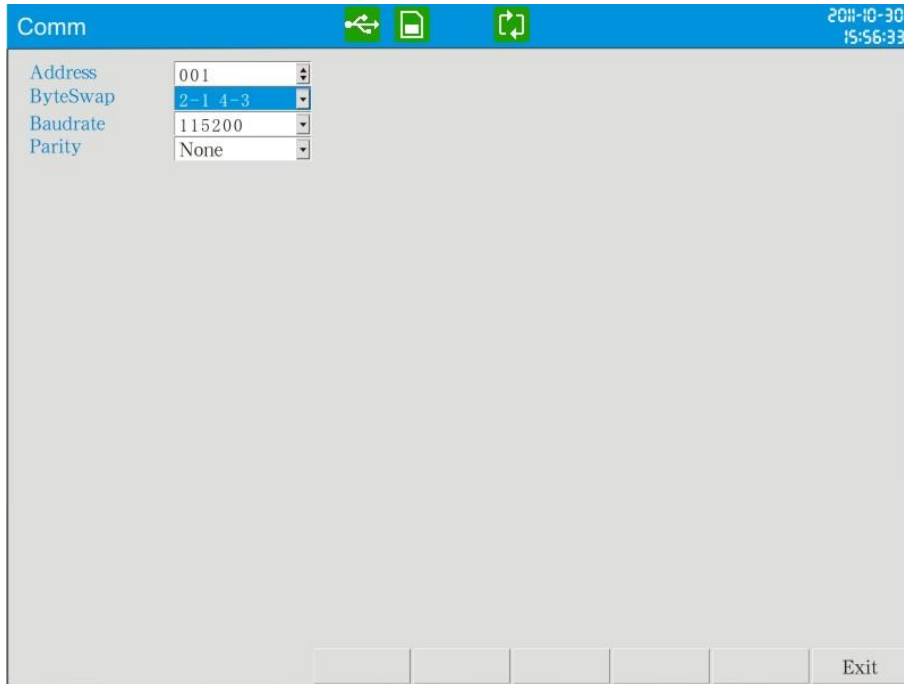
1. Use the [left and right   button] to move the cursor to the 【Byte swap】.
2. Use the [up and down keys] to choose byte-swapping method.
3. Confirming operation

After the parameter setting, select 【Exit】 there is a Frame.

Select 【Yes】 to save setting content, and exit [System] screen.

Select 【No】 to cancel setting content, and exit [System] screen.

Select 【Cancel】 to continue setting parameters in [System] screen.

13.5 Modbus-RTU protocol

Modbus based on serial communication run on the RS-232 or RS-485 bus, and in RTU mode, each byte format is:

- 1 Start bit
- 8 data bit, the lowest valid bit is sent first
- 1 parity bit, no parity is none
- 1 Stop bit

In Modbus based on serial communication, the additional address domain uses a 1-byte slave station address, and the data verification domain uses a 2-byte CRC check, the frame format is as follows:

Slave station address (1byte)	Function code (1byte)	Data (0~252byte)	CRC check (2byte)

For example：

Ask： 01 04 00 00 00 01 31 CA

Slave station address	Function code	Data		CRC check (LSB)
		Register address	The number of registers	
01	04	00 00	00 01	31 CA

Response： 01 04 02 00 64 B8 DB

Slave station address	Function code	Data		CRC check (LSB)
		The number of bytes	Register data	
01	04	02	00 64	B8 DB

13.6　set ethernet configuration

This section will introduce the parameter setting for Ethernet communication which includes IP address,port, subnet mask, and gateway.

Operation:

Parameter:

IP Address：It is the only address of each different internet devices which is used for distinguishing devices.

Subnet Mask：It is set according to different IP address. Default mask: 255.255.255.0.

Gateway ：The address of gateway.

Port：Software port number for Ethernet connects.

Timeout ：The connections retry intervals.

13.7 Modbus/TCP protocol

Modbus TCP runs on the TCP/IP network and all Modbus TCP frames are emitted via TCP register port 502.

When Modbus is applied to TCP/IP, the additional address domain uses a dedicated message header to identify the Modbus application data unit, which is called the MBAP message header(Modbus protocol message header). In addition, there is no data verification domain on TCP/IP, the accuracy of the transmitted data is verified by the TCP/IP and link layer (Ethernet) verification mechanism, the frame format is as follows:

MBAP prefix (7byte)	Function code (1byte)	Data (0~252byte)

The MBAP prefix (Modbus Application Protocol header) format is as follows:

Domain	Length	Description
The thing meta-identifier	2 byte	An identifier for request/response trans-action processing, which is used for transaction pairing. The configuration is initialized by the requester, then responder copies the transaction identifier of the request.
Protocol identifier	2 byte	0 identified as the Modbus protocol.
Length	2 byte	Subsequent data bytes, including cell identifiers, function codes, and data.
Cell identifier	1 byte	The identification number of a remote slave station connected on a serial link or other bus is generally the slave station address of a meter.

For example：

Request：00 00 00 00 06 01 04 00 00 00 01

MBAP prefix				Function code	Data	
					Register address	The number of registers
00 00	00 00	00 06	01	04	00 00	00 01

Response：00 00 00 00 05 01 02 00 64

MBAP prefix				Function code	Data	
					The number of bytes	Register data
00 00	00 00	00 05	01	04	02	00 64

13.8 register address

Channel	Real (signed short)	Real (float)	Accumulation (unsigned long)
1	30001	30101	30201
2	30002	30103	30203
3	30003	30105	30205
4	30004	30107	30207
5	30005	30109	30209
6	30006	30111	30211
7	30007	30113	30213
8	30008	30115	30215
9	30009	30117	30217
10	30010	30119	30219
11	30011	30121	30221
12	30012	30123	30223
13	30013	30125	30225
14	30014	30127	30227
15	30015	30129	30229
16	30016	30131	30231
17	30017	30133	30233
18	30018	30135	30235
19	30019	30137	30237
20	30020	30139	30239
21	30021	30141	30241
22	30022	30143	30243
23	30023	30145	30245
24	30024	30147	30247
25	30025	30149	30249
26	30026	30151	30251
27	30027	30153	30253
28	30028	30155	30255
29	30029	30157	30257
30	30030	30159	30259
31	30031	30161	30261
32	30032	30163	30263
33	30033	30165	30265
34	30034	30167	30267
35	30035	30169	30269
36	30036	30171	30271
37	30037	30173	30273
38	30038	30175	30275
39	30039	30177	30277
40	30040	30179	30279

Channel	Real (signed short)	Real (float)	Accumulation (unsigned short)
41	30041	30181	30281
42	30042	30183	30283
43	30043	30185	30285
44	30044	30187	30287
45	30045	30189	30289
46	30046	30191	30291
47	30047	30193	30293
48	30048	30195	30295

Note: Real (signed short) is value without point, e.g. Real value = 32.14, then the value you get is 3214(0x0C8E).

CHAPTER 14 CHECK SYSTEM INFORMATION

14.1 check system information and AD board

This section describes how to check system information, and the methods to check the status of AD board.

Operation:

Enter 【About】,the method to enter please see "log configuration".
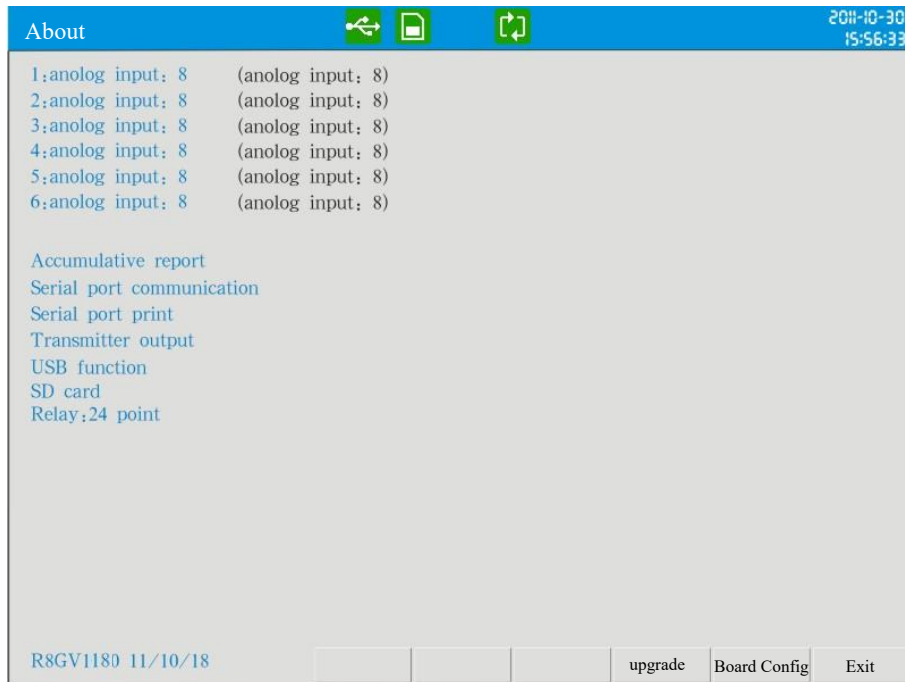
Blue Text (1: R7A8C: 8) is the inherent information in AD, black text (R7A8C: 8) is the current AD board information, if there is any difference between them, this shows that AD board failure, please contact the manufacturer for maintenance.

14.2 upgrade

This section describes the program upgrade through U disk or SD card.

Operation:

Put the program file (such as R8GV. img) provided by the manufacturer into the U disk or SD card, and insert the U disk or SD card into the USB or SD socket of the instrument to be upgraded.

Enter system Configuration screen【About】and choose【Upgrade】.

Enter 【About】,the method to enter please see "log configuration".
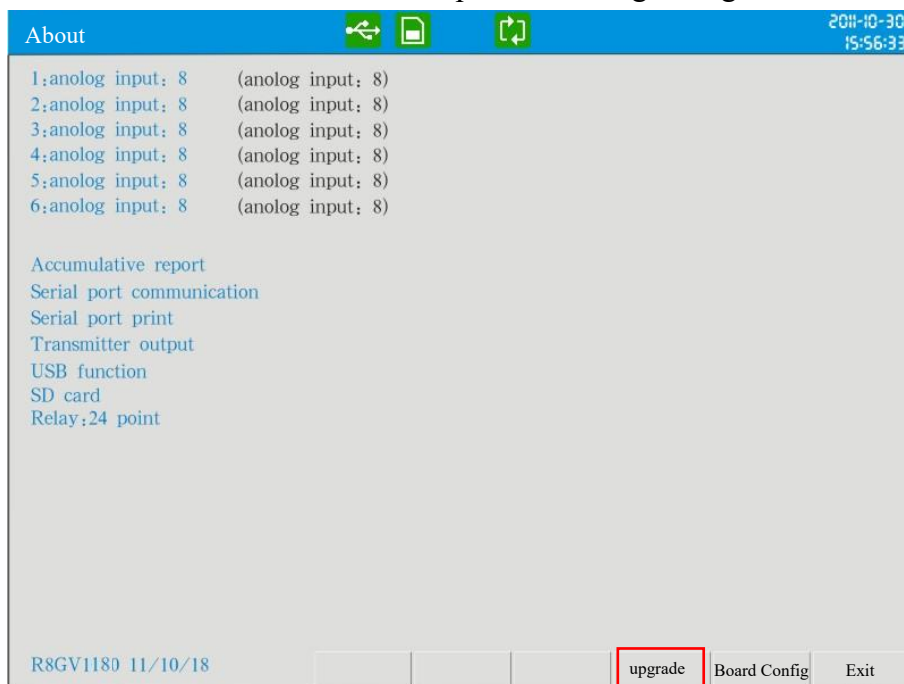
1. The red letter【firmware file has been found!】is displayed below, and a prompt window will pop up. After checking and confirming that the original firm and the upgraded firm are correct, select【Yes】.

2. Wait until the firmware upgrade is completed, restart the instrument, return to the 【About】interface, confirm that the firmware version has been updated, and unplug the U disk or SD card.

CHAPTER 15 IMPORT AND EXPORT CONFIGURATION FILES

15.1 export configuration file

This section describes the instrument configuration file export functions and operation methods.

Configuration file export, you can set up the information of the current instrument channel, including input configuration, recording configuration, alarm configuration, and export it to root directory of the external storage media .

Operation

Enter 【System configuration】 screen, for the method to enter, please refer to the section 『 log configuration 』 .
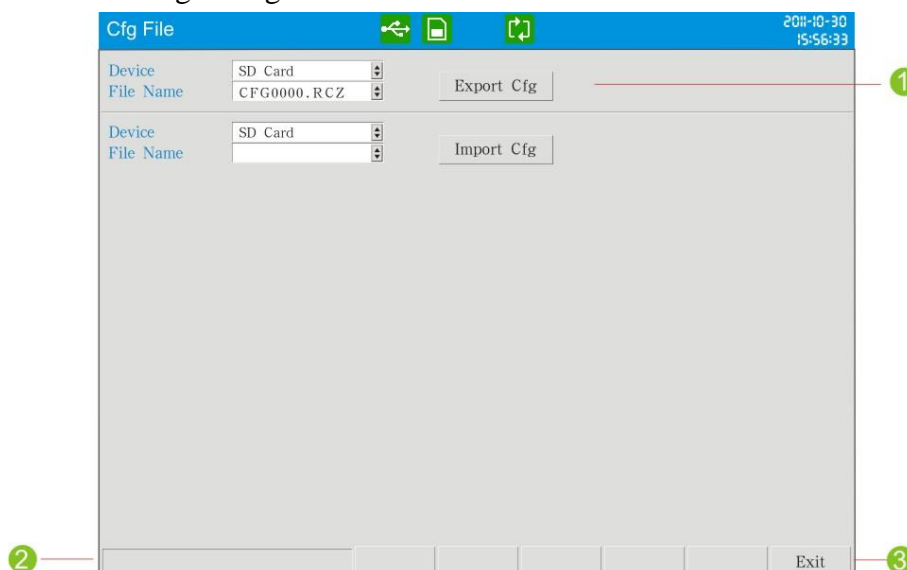
1. Use the [left and right button] to move the cursor to 【Device 】 , use the [up and down keys] to select the connected backup storage media U disk / SD card; use the [left and right button] to move the cursor to the 【File name】 ,and use the [up and down keys] or [Enter button] to modify the file name; use the [left and right button] to move the cursor to 【Export configuration】 ,use the [Enter key] to export configuration.
2. Show the configuration file export situation.
3. Use the [left and right button] to move the cursor to the 【Exit】 ,and use [Enter key] to exit the configuration file screen

15.2 import configuration file

This section describes the import meaning and operation method of configuration file. Import the configuration file: To set the configuration of multiple models of the same configuration, you can only configure one of the instrument configuration . You can export the configuration file of this instrument, for the configuration file export , please refer to the section 『configuration file export 』,and for the remaining instrument , they only need to import configuration file ,which makes multi-channel configuration simplier.

Operation

Enter 【system configuration 】, the method to enter , please refer to the section 『 log configuration』.
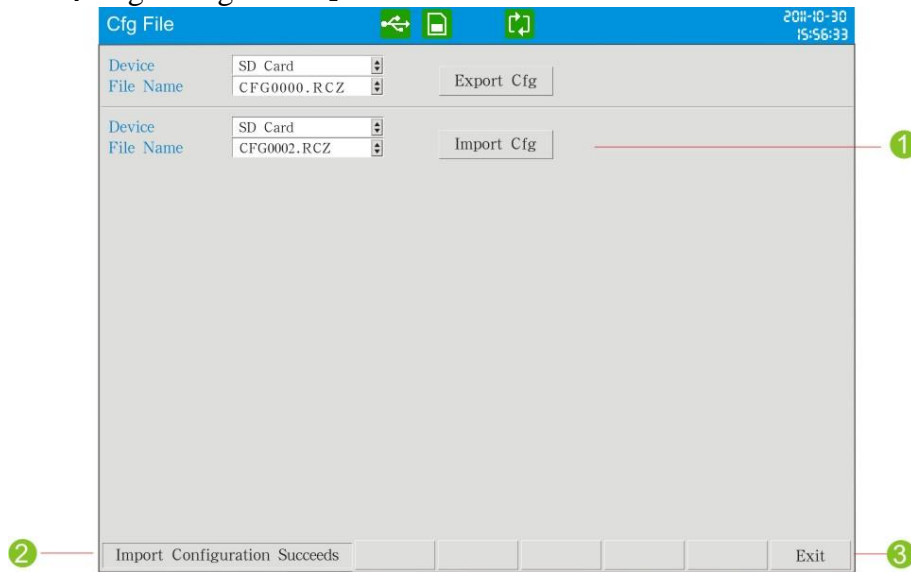
1. Use the [left and right button] to move the cursor to the 【Device】, use the [up and down keys] to select the connected backup storage media U disk / SD card; use the [left and right button] to move the cursor to the 【File name】, and use the [up and down keys] to confirm the imported file name; use the [left and right button] to move the cursor to the 【Import configuration】, and use the [Enter key] to import the configuration.
2. Show the configuration file import situation.
3. Use the [left and right button] to move the cursor to the 【Exit】,and use [Enter key] to exit the configuration file screen.

CHAPTER 16 SAFETY FUNCTION (FDA CERTIFICATION)

16.1 user login

This section describes the instructions and operation methods for user login of instrument 21CFR Part 11 FDA certified products..

Operation

Press [next page]+[EN] at the same time to enter the login screen, enter the user name and password, and enter the configuration after the authority verification. When the instrument leaves the factory, an administrator account has been built in, with the user name "admin" and the password "admin12345".
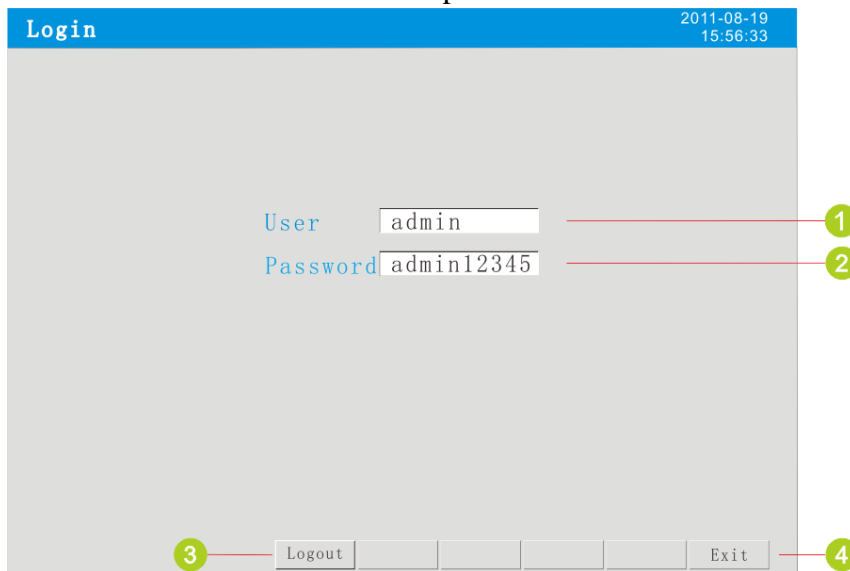
1. Use the [left and right button] to move the cursor to 【user name】, press [EN] to jump out of the edit bar and enter a known user name.
2. Use the [left and right button] to move the cursor to 【Password】, press [EN] to jump out of the edit bar and enter a known password.
3. Press 【Login】 to enter the 【Configure】 screen.
4. Press 【Exit】 to exit the 【Configure】 screen.

16.2 import configuration file

This section describes the instrument FDA authentication function to modify the account password settings. When using the "admin" account for the first time, the system forces the user to change the password. The password consists of numbers and letters, and the length of the password is 6-16 bytes.

Operation

Enter the password modification page.

1. Press 【EN】 to edit and modify the password.
2. Press【Modify】to confirm the password change.

Note: The valid period of the account password is 3 months. The password should be changed before it expires. If it is not changed after 3 months, the account cannot be logged in. You need to contact the administrator to reset the password.

When a user enters the wrong login password for three consecutive times, the user is disabled by the system, and the account disabled icon 🚫 appears in the title bar. The administrator can remove the disabled user through the password reset operation.

16.3 manage user

This section describes the user management settings and authority operation of the instrument FDA authentication function.

Operation

After logging in, the administrator can manage the account, such as register users, reset password, and delete users.
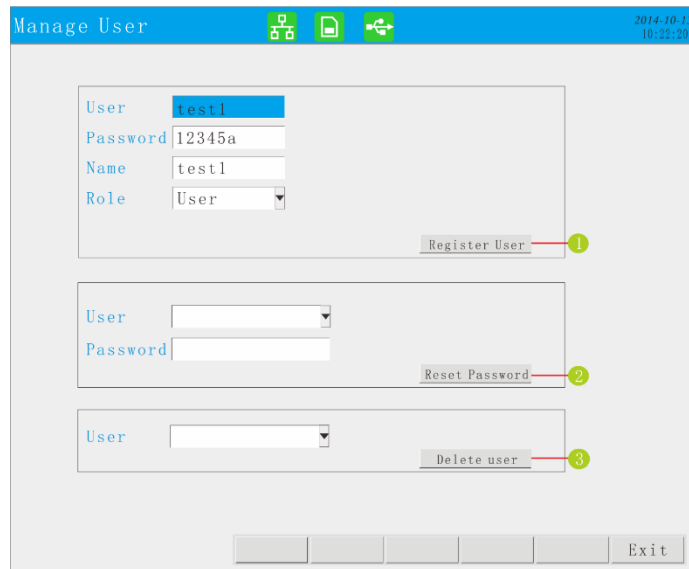
1. **Register user**

   Use the [left and right button] to move the cursor to 【User】【Password】【Name】 and press [EN] to edit.

   In the 【Role】 setting column, use [up and down button] to select. After setting, move the cursor to 【Registered User】, Press [EN] to register the user.

Set items	Description
User name	account name, 8 characters in length
Password	Account password, 6-16 characters in length, composed of numbers and letters
Name	account alias, 16 characters in length
Role	ordinary user, engineer, and administrator

   Three options for role assignment:

Role	Permission description
User	View all data and pictures of the instrument
Engineer	Set the instrument configuration parameters and view all data and pictures of the instrument
Administrator	Have management authority on the account, and can operate all parameter settings of the instrument

2. Reset password
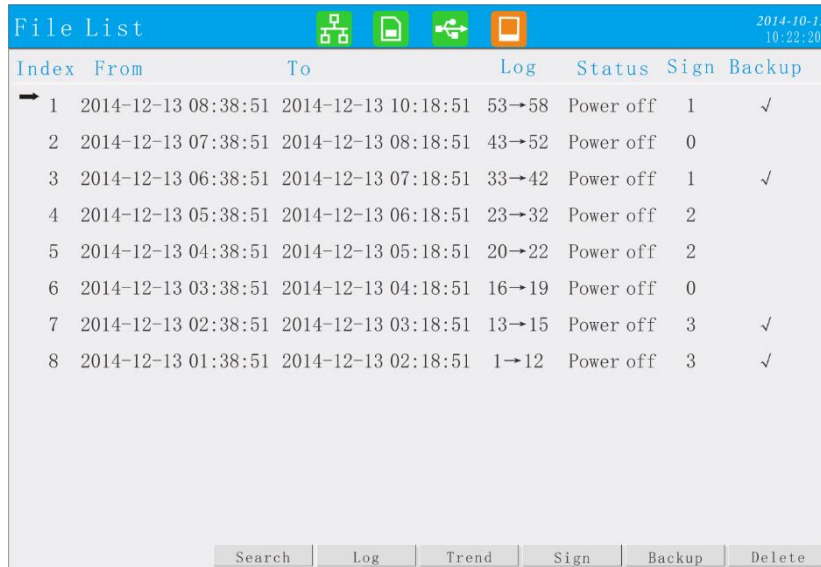
The administrator will reset the new password for the account when its password . Move the cursor to 【User】 and 【Password】, press [EN] to edit, then move the cursor to 【Reset Password】, and press [EN] to finish.

3. Delete user

The administrator will delete the expired or unused account. Move the cursor to 【User】, press [EN] to enter the name of the account to be deleted, and then move the cursor to 【Delete User】, and press [EN] to delete the account.

16.4 file list

This section describes the FDA certification function file list screen.

1. **File List**

Set items	Description
Index	File index value. The smaller the index value, the newer the file.
From	Start recording time of this data file.
To	End recording time of this data file.
Log	The sequence number combination of the first and last logs of the file from the formation to the end
Status	Record status of the data file.
Sign	The data file has been signed and verified by several users.
Backup	Whether the data file has been backed up to external storage.

2. **Document processing**

   Search：Search the file list for the specified date.

   Log：Quickly index the log to the specified file.

   Trend：View the history curve of the specified file.

   Sign：Sign the specified file.

   Backup：Backup the specified file.

   Delete：Delete single or multiple files.

3. Three conditions must be met to delete files in the file list
- Start with the last file in the file list
- The file has been signed (1-3 names can be signed)
- The file has been backed up

For example, log in to the account and click the 【Delete】 to select single or multiple file deletion methods. In the file list above, only No. 7 and No. 8 meet the deletion conditions.

16.5 signature

This section describes the FDA authentication function file signature operation

Operation

Use the [left and right button] to select a file, and press the 【Signature】 to sign the selected file.

Set items	Description
User	Signer's account name
Password	Signer's account password
Action	There are four options for the purpose of signing: produce, verify, approval, or others.
Remark	Remark the signed file

CHAPTER 17 SPECIFICATIONS

17.1 signal input and alarm

Measurement input

Item	Specifications
The number of input channels	simultaneously measuring up to 48 input channels
Measurement period	1 second
Signal type	DC current (I), DC voltage (V), thermocouple (TC), thermal resistance (RTC), frequency (FR)

Input measurement range and the measurable range

Type	Range	Measurable range
Current	4-20mA	4.00mA ～ 20.00mA
	0-20mA	-20.00mA ～ 20.00mA
	0-10mA	-10.00mA ～ 10.00mA
Voltage	1-5V	1.000V ～ 5.000V
	0-5V	-5.000V ～ 5.000V
	0-10V	-10.00V ～ 10.00V
	20mV	-20.00mV ～ 20.00mV
	100mV	-100.00mV ～ 100.00mV
resistence	400Ω	0.0Ω ～ 400.0Ω
	175Ω	0.0Ω ～ 175.0Ω
Digital signal	FR	0Hz ～ 10000Hz
	FR.	0.0Hz ～ 3000.0Hz
RTD	PT100	-200.0℃ ～ 650.0℃
	PT100.	-50℃ ～ 150.0℃
	Cu50	-50.0℃ ～ 140.0℃
	Cu53	-50.0℃ ～ 150.0℃
	BA1	-100℃ ～ 600℃
	BA2	-100℃ ～ 600℃
Thermocouple	S	-50℃ ～ 1768℃
	R	-50℃ ～ 1768℃
	B	250℃ ～ 1820℃
	K	-50℃ ～ 1300℃
	N	-200℃ ～ 1300℃
	E	-100℃ ～ 1000℃
	J	-100℃ ～ 1000℃
	T	-200℃ ～ 400℃
	WRE5-26	0℃ ～ 2310℃

Thermocouple	WRE3-25	0℃ ～ 2315℃
	F1	600℃ ～ 2000℃
	F2	600℃ ～ 2000℃
Digital	Voltage	0（0V ～ 0.8V） 1（2V ～ 5V）
	Switch	0（200Ω～∞） 1（0 ～ 80Ω）

Measuring current: I = 0.25mA (resistance, heat resistance)

Thermocouple burnout	Choose the maximum, minimum, error flag or keeping the former displayed value check current: About 2.5uA

Item	Specifications
Thermocouple cold junction compensation	Using internal cold junction compensation, the compensation accuracy :± 0.5 ℃
Digital filter	0 ~ 9.9 seconds inertia filter
Vacuum operation	
General algorithm	LOG curve is used in the whole range
Sub-algorithm	linear operation is used in every section

Alarm

Item	Specifications
The number of alarms	Each channel has 4 alarm
alarm type	High highalarm type , high alarm, I alarm , D alarm
Alarm delay time	0-10s
Alarm output	Alarm outputs to the internal relay Normally open alarm relay: 36 Or 24 (If the channel number is more than 36, it is 24, otherwise, it is 36) Normally closed alarm relay: 18 Or 12 (If the channel number is more than 36, it is 12, otherwise, it is 18) Internal relay operations: OR operation
Display	When alarm occurs, the corresponding screen displays the alarm status; the status display section displays the alarm icon.
Alarm information	Display alarm log in the alarm list

17.2 display function

Display

Item	Specifications
Display *	10.4-inch TFT color LCD display (800× 600 points)
Display color	256 colors

Display Information

Item	Specifications
Display channel group	Channels will be allocated to real-time curve and historical curve show and then display
group Number	8
the number of channels which an be allocated to each group	
	≤ 8
Real-time curve display	
Renewal rate	1 record interval
Waveform width	1 pixel
Display method	Display perpendicular axes with timeline (T) and the measurement axis (Y)
	Layout: horizontal, vertical
	Div Curve cycle: recording interval × 60 div
Scale	To display each channel (0% ~ 100%)
Digital Display	Display measured values with digital
Update Rate	1 second
Bar graph display	Display measurement on the bar graph
Update Rate	1 second
ruler	0% ∼ 100%
Historical curves show	Display stored data in the memory
Timeline operation	can enlarge one times / 2 times / 4 times / 8 times / 16 times / 32 times
Alarm list display	Display up to 256 alarm records

Other displayed information

Item	Specifications
Channel-bit	7 Chinese characters or 15 letters(numbers)
Channel units	Three Chinese characters 7 letters (numbers)
Status display section Display content	Show the status of this instrument in the upper part of the display screen Searching status、 Display screen name, card status, alarm status, SD card status, USB device status, circular display status, year, month, day, hour, minute, seconds
Automatic switch of Show group	At the specified time interval to switch display groups Time interval: 5 seconds
Language	Simplified Chinese, English
System information display	Show the number of input and output card channels, relay output channels, instrument additional features, firmware version, production date and released date

17.3 data storage function

Setting

Item	Specifications
External storage media	Back up the record data in the device
Media	U Disk, SD card
Capacity	Up to 32GB(U disk), 32 GB (SD card)
File format	FAT32
File Name	DAT+ "number" (can edit)
Report Name	CSV
	Shift report: REP+ "number"(can edit)
	Daily report: RPTD+"number"（can edit）;
	Monthly report: RPTM+"number"（can edit）;
	Annual report: RPTY+"number"（can edit）

Data type

Item	Specifications
Data Size	
Sampled data	2 bytes/ data values
Cumulative amount	8 bytes/ data values
Data Format	Binary Data
The sampling period	Equal to recording interval
Recording method	Always recording
Recording type	Intermittent storage

17.4 other standard features

Time-related functions

Item	Specifications
Clock	Can operate in 2000 ~ 2099
Clock Accuracy	± 10ppm (0 ~ 50 ℃), does not include the delay caused by the error when the power is on(less than 1 second)
Life of Clock battery	About 10 years (under room temperature)

The type of characters which can be inputted

Item	Specifications
Characters	In Chinese, English (uppercase, lowercase), numbers, and symbols (within limitations)

17.5 choose accessories

Alarm output relay

Item	Specifications
Action	Output relay contacts signal from the back panel of the terminal when alarm occurs
Output points	Normally open contact :36 (input channel ≤ 36) 24 (input channels> 36) Normally open contact :18 (input channel ≤ 36) 12 (input channels> 36)
Relay electric shock rating	250VAC(50/60Hz)/3A，250VDC/3A((load resistance))
Output Type	Normal open or closed
Relay Operation	OR operation

RS232C/RS485

Item	Specifications
Physic level	RS-232、RS485(option)
Protocol	Modbus-RTU
Communication rate	1200/2400/4800/9600/19200/38400/57600 bps
Byteswap	2-1 4-3、1-2 3-4、4-3 2-1、3-4 1-2
Data length	8bits
Stop bit	1bit
Parity bit	1bit
parity	None/ odd/ even parity

Ethernet

Item	Specifications
Interface	RJ45
Connection	10M
Protocols	Modbus-TCP

24VDCPower Distribution

Item	Specifications
Loop	6
Output voltage	24VDC±10%
Maximum output current	60mADC(overload protection current: approximately 90mADC)
Allowed impedance	≤ 750Ω

USB Function

Item	Specifications
USB port	Compatible with USB2.0 protocol
Number of ports	1
Capacity	Maximum: 32 GB
Power Supply	5V±10%，100mA
Devices can be connected	U disk

SD card function

Item	Specifications
SD card port	Compatible with SD protocol(NOT SDHC)
Number of ports	1
Capacity	Maximum: 32 GB
Devices can be connected	SD card

Analog signal output

Item	Specifications
Output Type	4-20mA
Number of output channels	Up to 8
Allowed impedance	≤ 750Ω

17.6 general specifications

Frame

Item	Specifications
Installation	Embedded instrument panel installation (vertical plane)
Angle	Allow for a maximum of 30 degrees after the tilt from horizontal
Plate thickness of installation	2 ～ 10mm
Material	Panels and Terminal Material: ABS plastic Shell: Aluminum alloy
External dimensions	288(W)×288(H)×245(D)(D：the length from the installation panel to terminal)
Weight	About 9 Kg(cluding configuration)

Standard operating conditions

Item	Specifications
Supply power Voltage	220VAC
Power Frequency	50Hz
Ambient temperature	0℃ ～ 50℃
Environment Humidity	20% ～ 85%RH(non-condensing)
Warm-up Time installation location	30 minutes after power is switched on Indoor

Power

Item	Specifications
Rated supply voltage	220VAC
Allowed voltage range	85VAC ～ 220VAC
Rated power frequency	47-63Hz
Power consumption	≤20W(including the matching function)

Insulation

Item	Specifications
Resistance voltage	Measurement input terminals:： 400V Between protective ground and measured terminal: 1000V
Grounding resistance	Grounding resistance $\leq 10\Omega$

Transportation and storage condition

Item	Specifications
Temperature	-10℃ ～ 60℃
Humidity	0% ～ 95%(non-condensing)
Shake-proof	10 ～ 55Hz，10m/S^2，2 hours
Impact-proof	Working:30/S^2(3g)，Transporting:100g

Electrical characteristic

Signal type	Range	precision（25℃）	Input impedance
4-20mA	4.00-20.00	±0.2%	≤300
0-20mA	0.00-20.00	±0.2%	≤300
0-10mA	0.00-10.00	±0.2%	≤300
0-5V	0.000-5.000	±0.2%	1M
1-5V	1.000-5.000	±0.2%	1M
0-10V	0.000-10.000	±0.2%	1M
0-20mV	0.00-20.00	±0.2%	10M
0-100mV	0.00-100.00	±0.2%	10M
400ohm	0.0-400.0	±0.2%	---
175ohm	0.0-175.0	±0.2%	---
Fr	0-10000	±1Hz	---
Fr.	0.0-3000.0	±0.1Hz	---
S	-50-1768	±2℃	10M
R	-50-1768	±2℃	10M
B	250-1820	±2℃	10M
K	-200-1372	±1℃	10M
N	-200-1300	±1℃	10M
E	-200-1000	±1℃	10M
J	210-1200	±1℃	10M
T	-200-400	±1℃	10M
WRE5-26	0-2310	±2℃	10M
WRE3-25	0-2310	±2℃	10M
F1	700-2000	±2℃	10M
F2	700-2000	±2℃	10M
Pt100	-200.0-650.0	±0.4℃	---
Pt100.	-50.0-150.0	±0.2℃	---
Cu50	-50.0-150.0	±0.4℃	---
Cu53	-50.0-150.0	±0.4℃	---
BA1	-200.0-650.0	±0.4℃	---
BA2	-200.0-650.0	±0.4℃	---

Frenquency input board

Item	Specification
Channel number	8 channel/ per board
Low level	Minimum:-5V，Maximun2V
High level	Minimum:4V，Maximun26V
Duty ratio	10%-90%
Drive current	Minimum:1.5mA

Anolog output board

Item	Specification
Output signal	4－20mA
Resolution ratio	12 bit
load	750ohm
precison	0.2%F.S
Response time	1second
Temperature drift coefficient	1uA/℃

Other standard

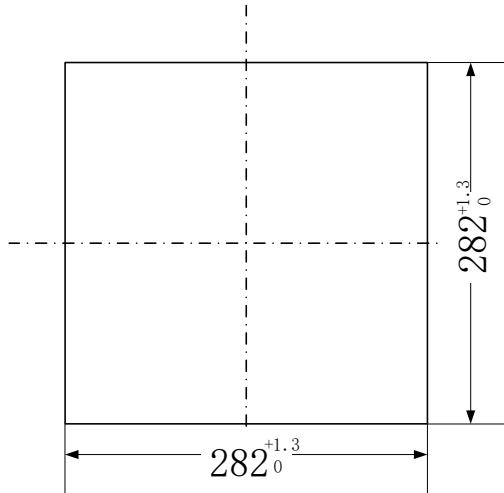| Item	Specification
Data storage limit	About 10 year
Safty agency approval	EN61010-1:2001
Electromagnetic compatibility	EN61326-1:2006 EN61000-3-2:2006 EN61000-3-3:2008
Protection grade	Front panel IP50，complete machine:IP40

17.7 external dimensions
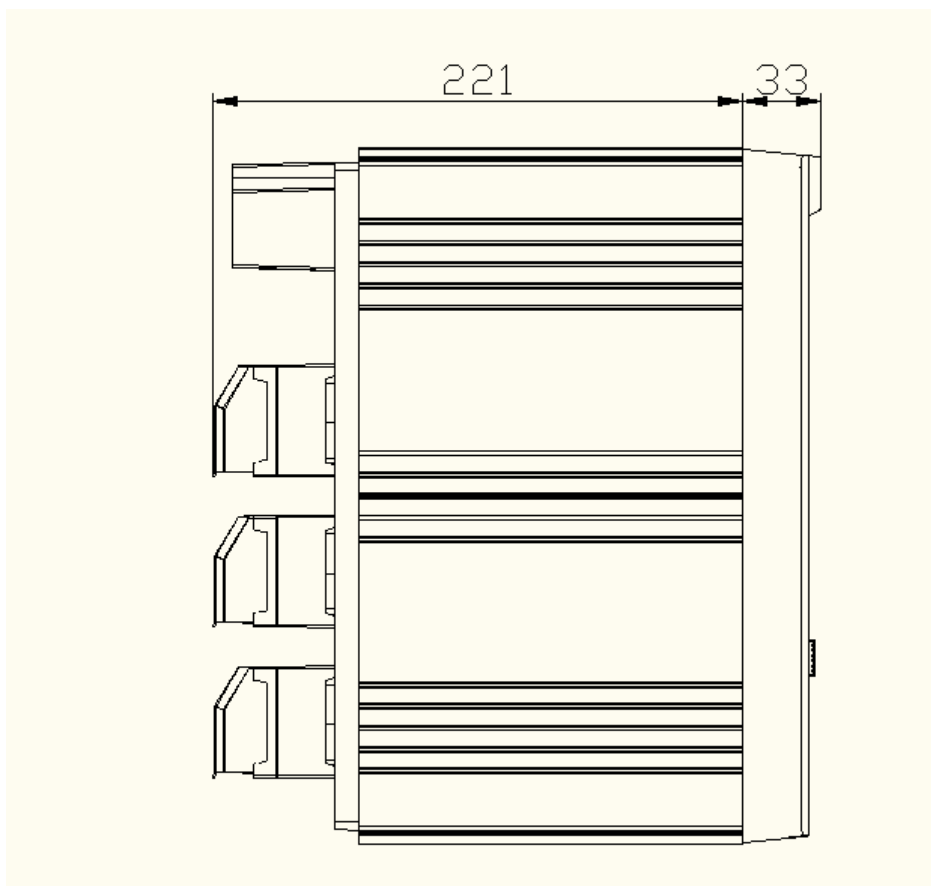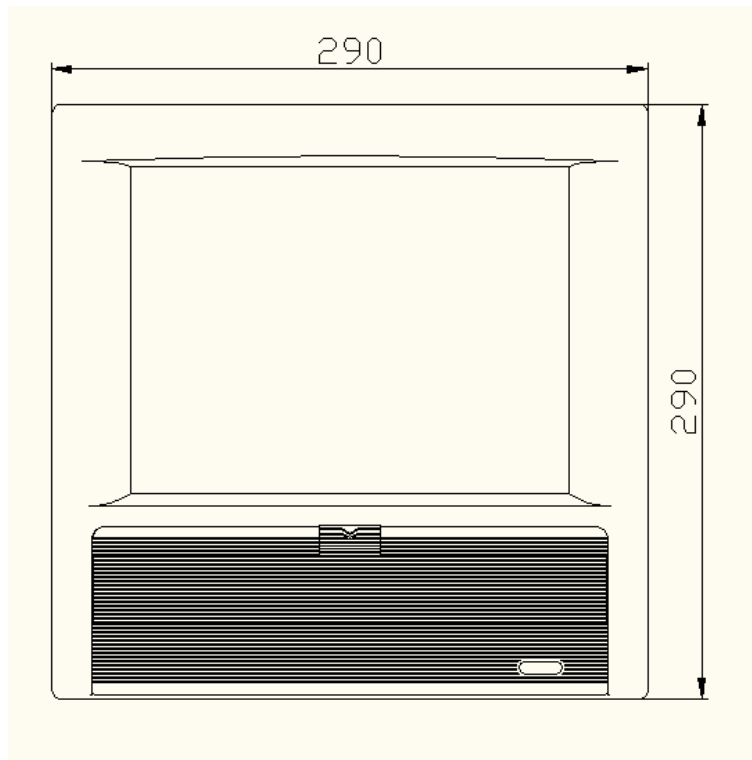
Dimensions of Instrument installation

Unit: mm

Hole size of Instrument

$282^{+1.3}_{0}$ (vertical)

$282^{+1.3}_{0}$ (horizontal)

Hole size of container

Min:340 (vertical)

Min:340 (horizontal)