
**User's
Manual**

KT100R/H

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

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IM01C12R01E-01	May 2011

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.

No.	Name	Quantity	Notes
1	Mounting bracket	2	For panel mounting
2	User's Manual	1	This manual
3	Certification	1	Manufacture Date
4	Software	1	CD-ROM, For Windows XP/ Windows Vista/ Windows 7.
5	Communication Cord	1	2m(Included only when the Communication is ordered.)
6	U Disk	1	Included only when the external storage is ordered. Capacity and model of the USB storage may vary.
7	SD card	1	Included only when the SD card storage is ordered. Capacity and model of the storage may vary.

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	2GB/4GB
2	SD Card	1	2GB/4GB

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 】

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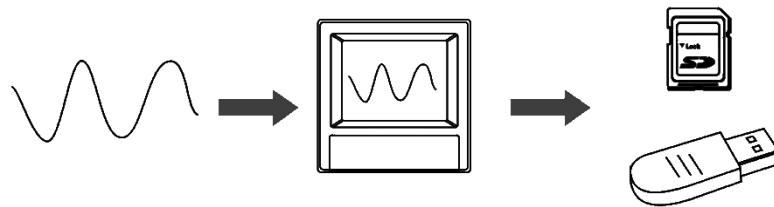
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CHAPTER 1 OVERVIEW OF THE FUNCTIONS

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 1~4.

The scan interval of measurement is 1 second.

Input Type and Computation

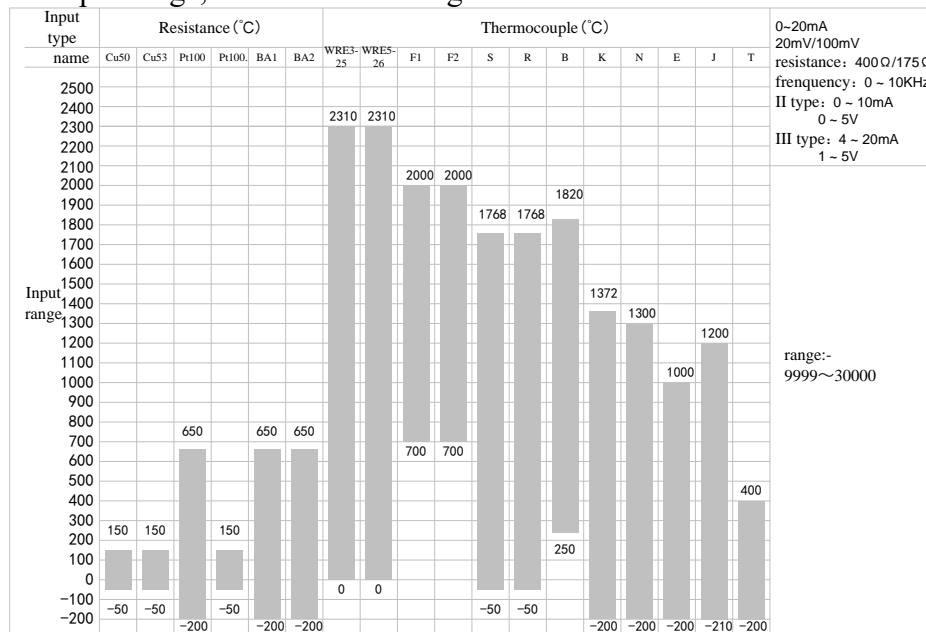
You can select the input type of a measurement channel as follows. You can also perform computation for instance, the “square root,” on the measured data. For the procedure related to setting the different modes, see section 『System Configurations』

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

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.



Burnout

When measuring temperature with a thermocouple / thermal resistance /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”.

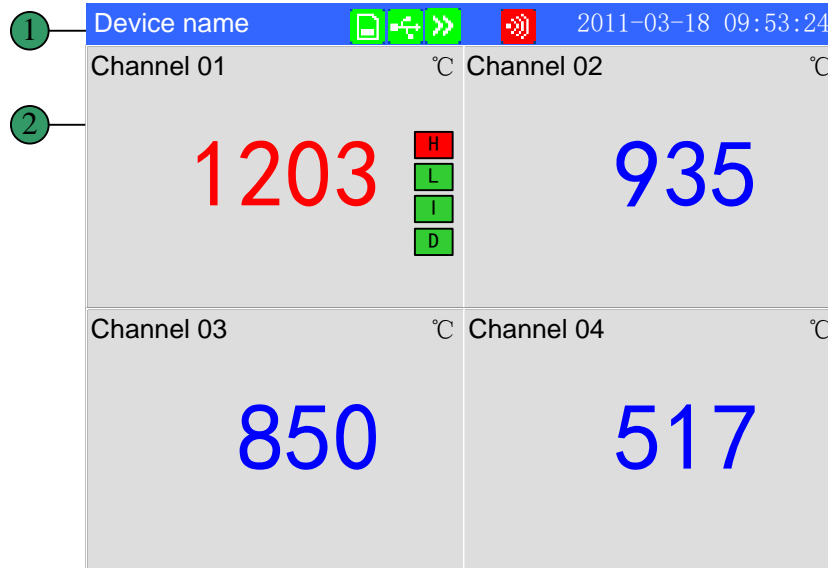
Filter

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 3.5" TFT color LCD (320-by-240 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 4 channels can be assigned to a single group. For the procedure used to assign channels to groups, see section 『configuration display』.

Up to 4 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 data query. Data query, including 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, 1GB - 4GB (optional);

Normal SD card, 1GB - 2GB(optional), non SDHC card.

Measurement period and recording intervals

AD sampling period is 20 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 after the instrument is turned on.

If the instrument is unplugged, new historical data file will be generated 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 time to time. When stopping recording or reaching up to the setting trigger condition, the instrument will also automatically back up the historical data to SD card. For the trigger condition setting and operation, please refer to the section 『record configuration setting 』 .

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 (ADDITIONAL SPECIFICATIONS)

The Accumulation computation and reports can be performed. The maximum accumulation cannot exceed 999999999, or else 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.

- Shift report: According to the number of class and time settings to show the cumulative amount of each shift.
- Hourly report: Show the accumulative amount generated per hour.
- Daily report: Shows the accumulative amount generated every day.
- Monthly report: Shows the accumulative 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 1 channel 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 communicate with PC via serial cable (RS232C/RS485). And also can print data by micro printer. (The instrument needs RS232 C interface).

RS232C/RS485 Communications

RS232C or RS485 can be selected 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 configuration software.

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 1 channel power supply of 24 VDC. The maximum current of each channel can be provided is 30 mA.

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

CHAPTER 2 BEFORE USING THE INSTRUMENT

2.1 PRECAUTIONS ON THE USE OF THE INSTRUMENT

Read the following precautions before using the instrument and the external storage medium (U disk).

Handling Precautions

- Be careful when cleaning the instrument, especially any plastic parts. When cleaning, wipe with a dry, soft cloth. Do not use chemicals such as benzene or thinner, since these may cause discoloring and deformation.
- Keep electrically charged objects away from the instrument as this may cause malfunction.
- Do not apply shock to the instrument.
- If there are any symptoms of trouble such as strange odors or smoke coming from the instrument immediately turn OFF the power and unplug the power cord. Then, contact your dealer or our company.

Handling precautions of external storage media

- Handling external storage media carefully as they are delicate products.
- Please note the U disk ESD protection.
- Recommend using this company's products
- If you are using them in a high-temperature environment (greater than 40°C), we recommend the external storage medium be inserted into the drive when saving the data and be removed after the data have been saved.
- Remove the external storage medium from the drive when turning ON/OFF the instrument.
- When the store lights (in the U disk) light up, do not remove the storage media, otherwise it may destroy the data.
- For general precautions please see the instruction manual that came with the external storage medium.

2.2 INSTALLING THE INSTRUMENT

To the installing place of this instrument, the installation method will explain here. Be sure to read this section before install it.

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
<ul style="list-style-type: none">● 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:

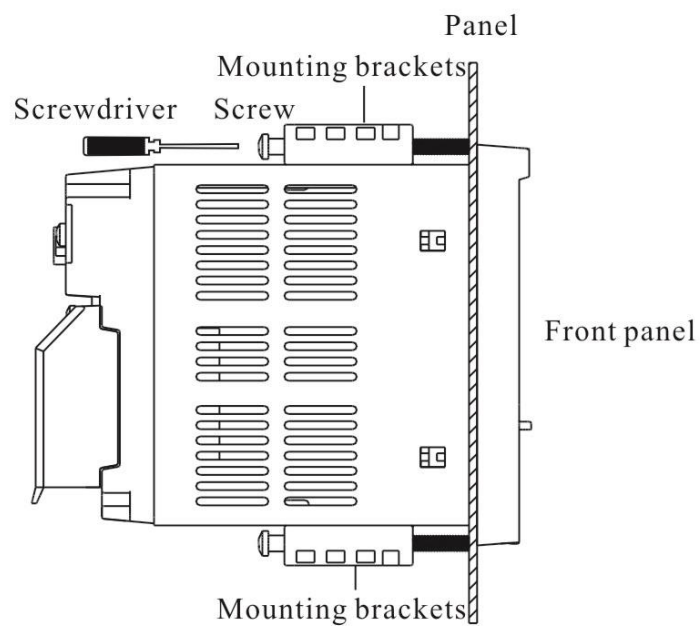
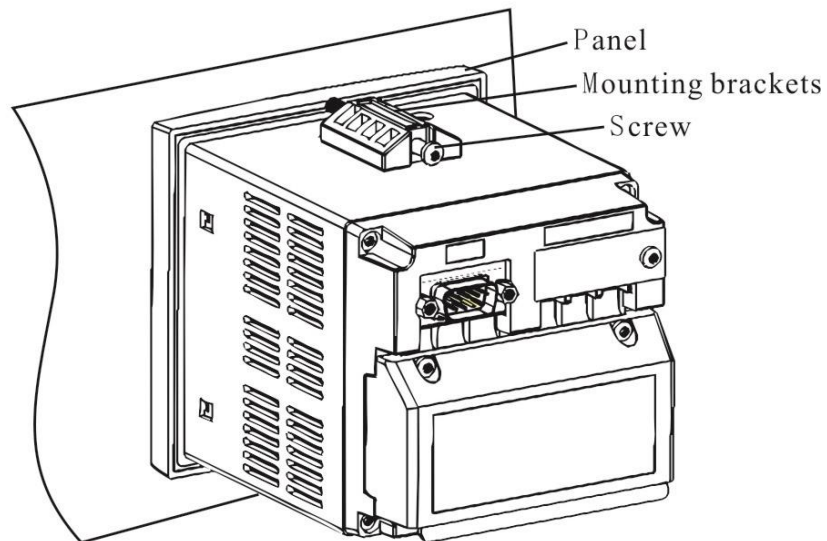
1. In direct sunlight or near heat sources
Install the instrument in a place with small temperature fluctuations near room temperature (23.C). Placing the instrument in direct sunlight or near heat sources can cause adverse effects on the internal circuitry.
2. Where an excessive amount of soot, steam, moisture, dust, or corrosive gases are present
Soot, steam, moisture, dust, and corrosive gases will adversely affect the instrument. Avoid such locations.
3. 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.
4. Bad angle for viewing the screen
Because the instrument uses a 3.5” 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.

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



2.3 INPUT AND OUTPUT SIGNAL WIRING

Here will explain the measurement of input / output signal lines. Be sure to read this section before connecting the input and output signal wiring.

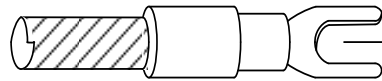
Caution

If a strong tension is applied to the cable wired to the instrument, the terminals of the instrument and the cable can be damaged. In order to prevent tension from being applied directly on the terminals, fasten all wiring cables to the rear of the mounting panel.

Precautions to be taken while wiring

Take the following precautions when wiring 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

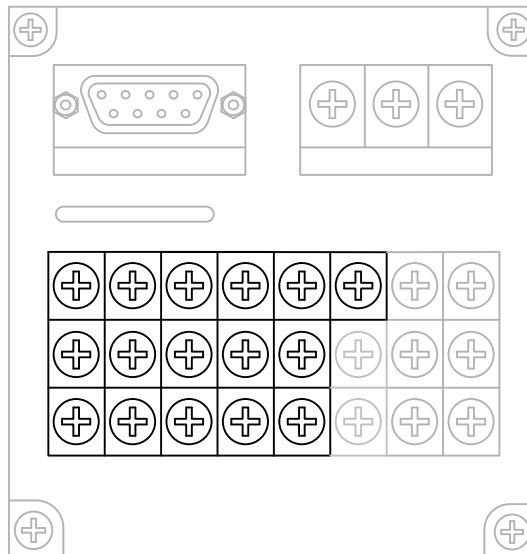
- Ground the instruments to the same point.
- Do not turn ON or OFF another instrument during operation. This can have adverse effects on the other instruments.
- RTD cannot be wired in parallel.
- Current signal cannot be wired in parallel.

CAUTION

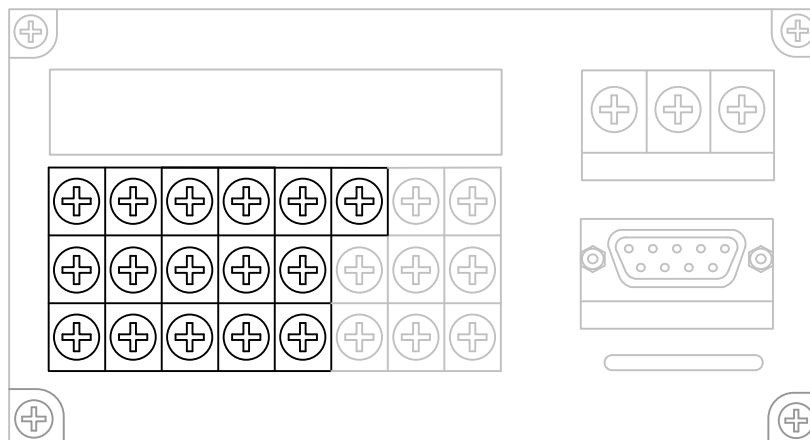
- Do not apply input signals that exceed the following values. This can damage the instrument.
1. Maximum input voltage
Voltage range of 0.2 VDC or less or thermocouples: $-1\text{V} \sim +8\text{V}$
Voltage range between 2 and 5 VDC: $-1\text{V} \sim +8\text{V}$
Current: $-4\text{mA} \sim +25\text{mA}$
 2. Maximum common mode noise voltage
250VACrms (50Hz)
-

Wiring Procedure

The position of input / output signal terminal



KT100S



KT100H

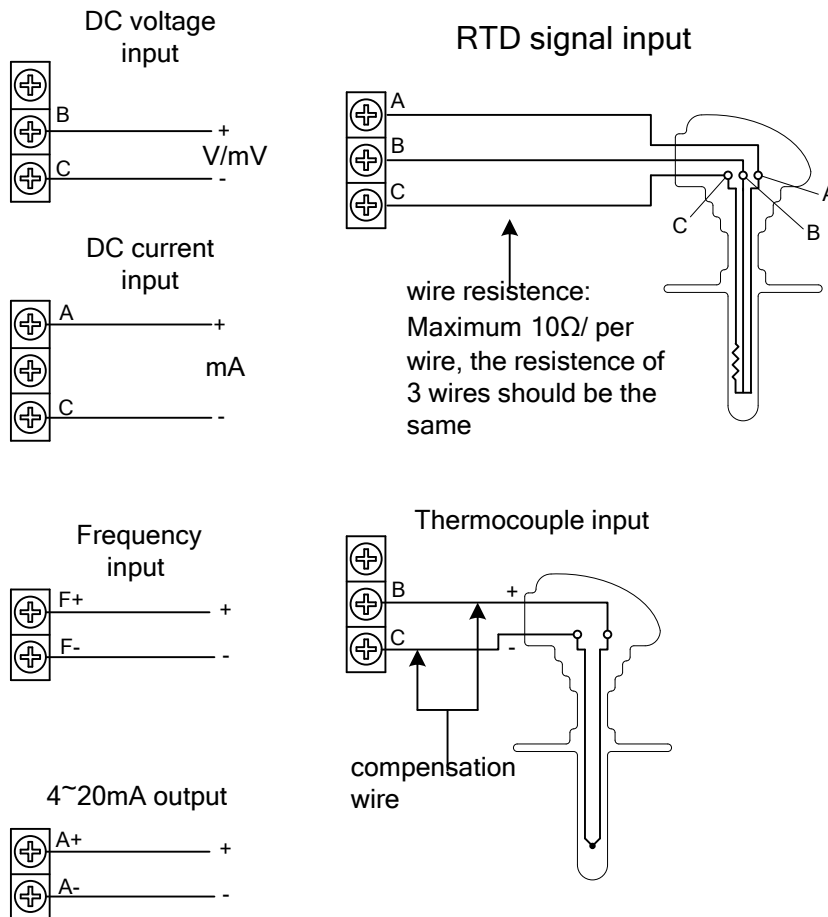
Input / output signal channel arrangement

1A	2A	3A	4A	A+	A-
1B	2B	3B	4B	F+	
1C	2C	3C	4C	F-	

Note:

Frequency input and 4-20mA analog output use the independent terminal.

Wiring diagram



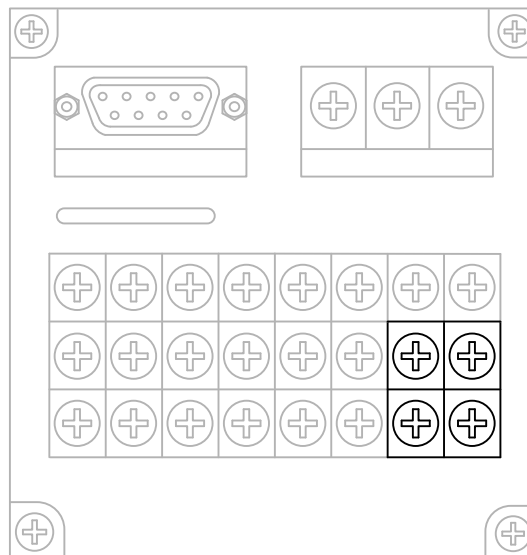
2.4 ALARM OUTPUT WIRING (OPTION)

WARNING

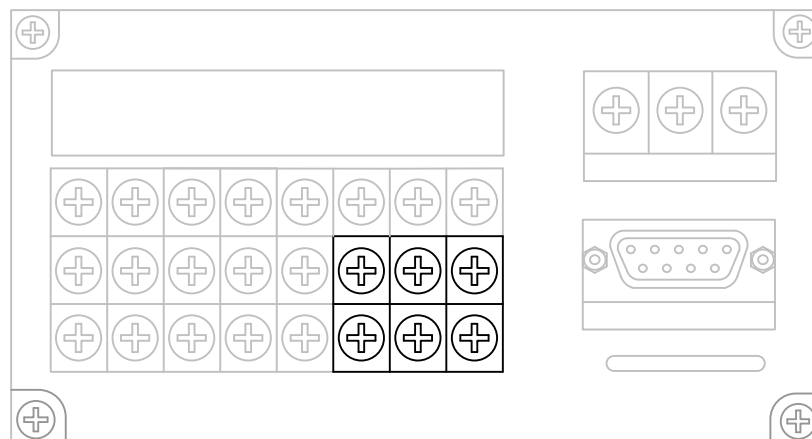
- To prevent electric shock, ensure the main power supply is turned OFF.
 - If a voltage of more than 30 VAC or 60 VDC is to be applied to the alarm output terminal, use ring-tongue crimp-on lugs with insulation sleeves on all terminals to prevent the wires from slipping out when the screws become loose. 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.

Alarm Output Terminal Position

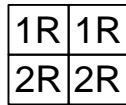


KT100S

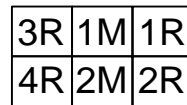


KT100H

Alarm relay contact arrangement

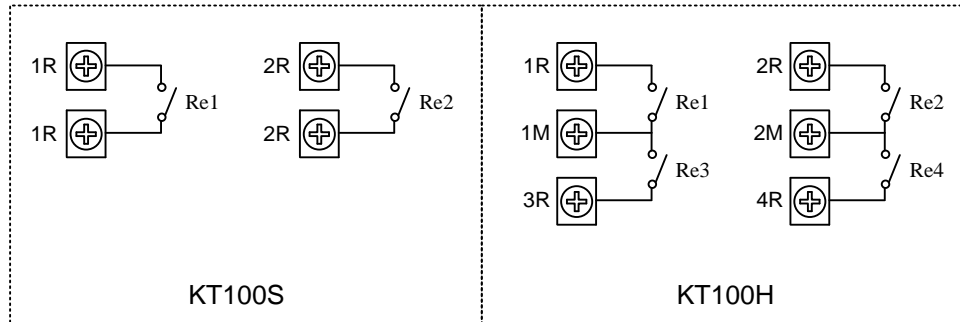


KT100S



KT100H

Wiring Diagram



Relay Specifications

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

2.5 CONNECT POWER SUPPLY

Precautions to be taken when wiring the power supply

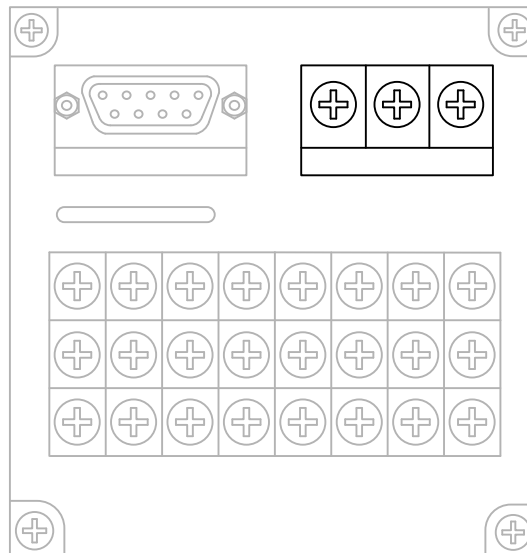
To prevent electric shock and damage to the instrument, observe the following warnings.

WARNING

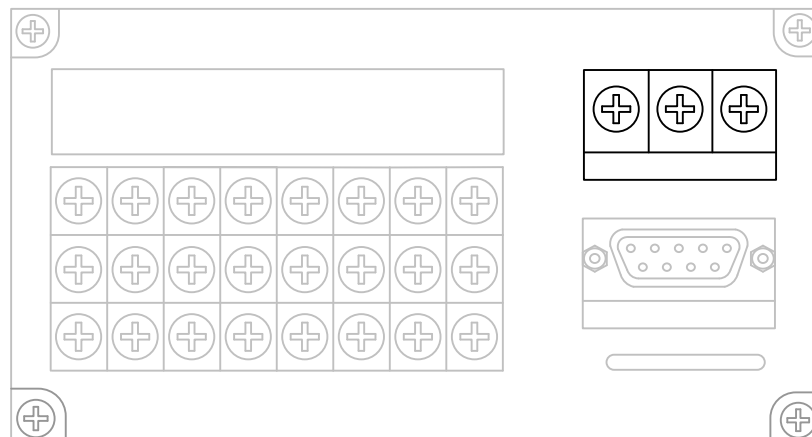
- To prevent electric shock, ensure the main power supply is turned OFF.
 - Make sure to earth ground the protective earth terminal through a grounding resistance less than 10Ω before turning ON the power.
 - Use crimp-on lugs (designed for 4mm screws) for power and ground wiring termination.
 - Connect a fuse (between 1A and 5A) to the power line.
-

Wiring Procedure

The position of power terminal

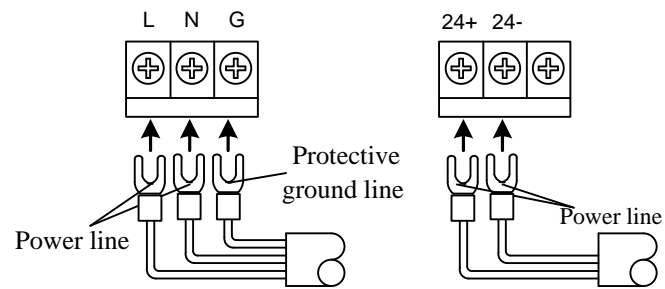


KT100S



KT100H

Terminal Arrangement



Relay Specifications

Item	AC supply	DC supply
Input voltage	85VAC ~ 265VAC	24VDC±10%
Input frequency	50/60Hz	

2.6 24VDC TRANSMITTER POWER WIRING (OPTION)

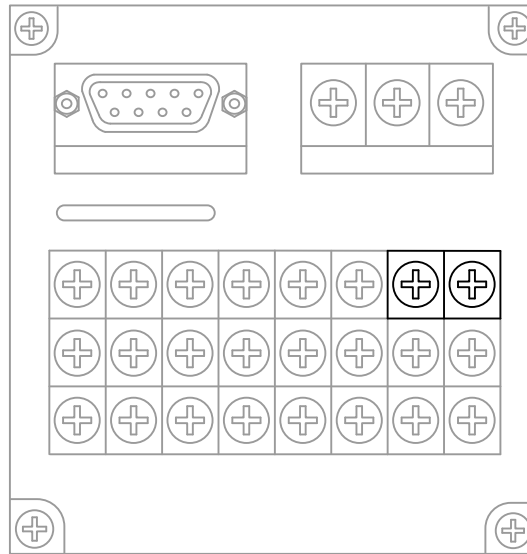
Transmitter power output

CAUTION

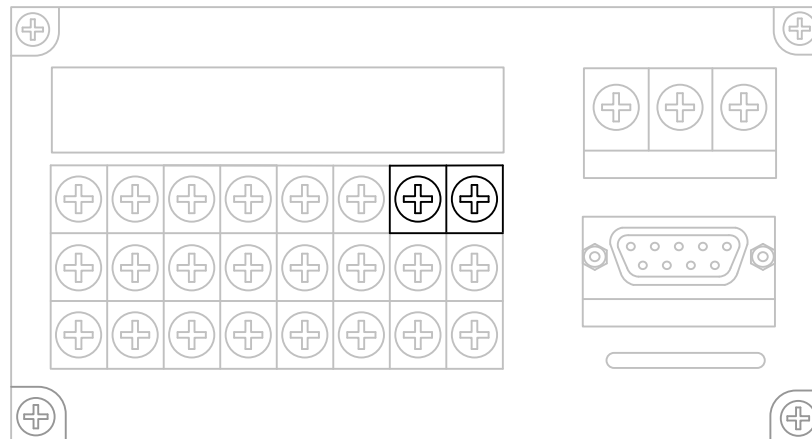
- Never short-circuit the power supply terminals or apply an external voltage, otherwise damage to the instrument may result.
-

Wiring Procedure

The position of transmitter power output terminal

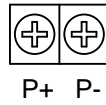


KT100S

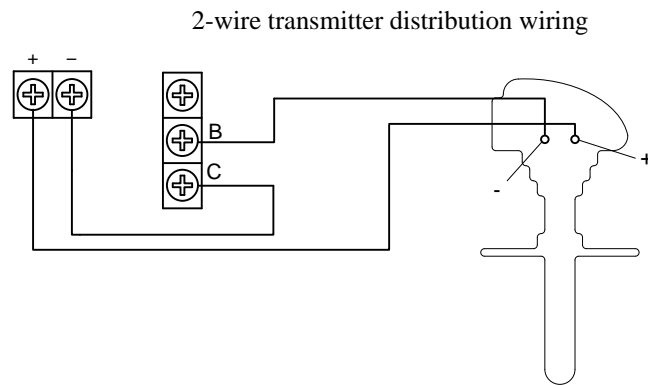


KT100H

Output channel arrangement of transmitter power



Wiring Diagram



24VDC Transmitter Power Supply

Loop: 1

Output voltage: 22VDC ~ 25VDC (rate output current)

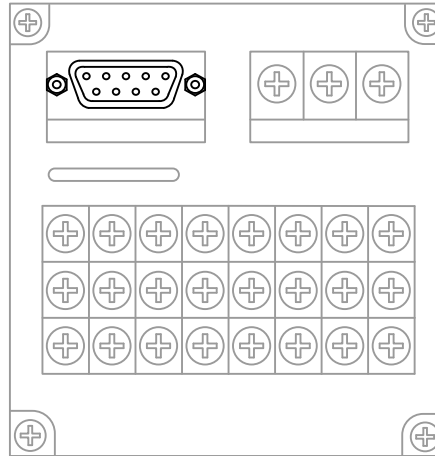
Maximum output current : 30mADC (over-loading protect current: about 100 mADC)

2.7 RS232C/RS485 COMMUNICATION WIRING

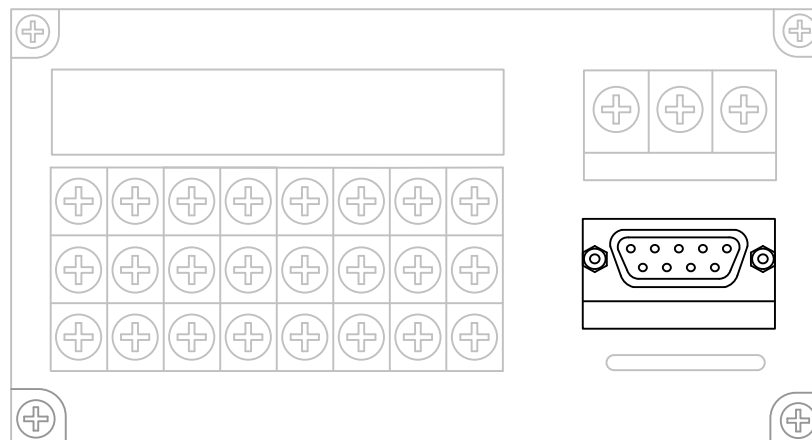
Here explains RS232C/RS485 communication wiring. Be sure to read this part before connecting.

Wiring Procedure

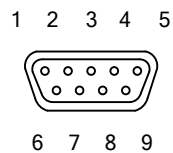
RS232C/RS485 Communication wiring position



KT100S

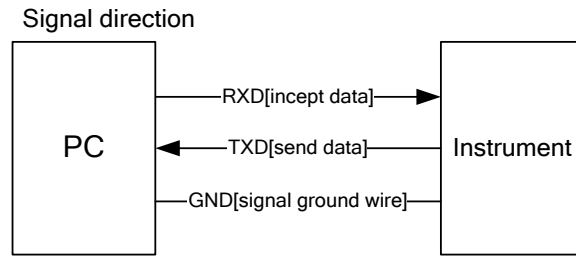


KT100H

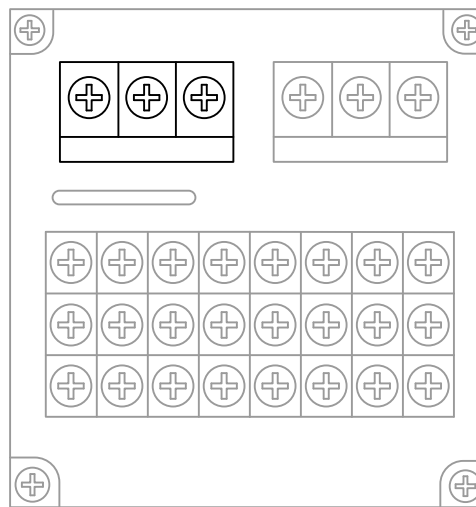


Pin number	Signal Name	Description
2	RXD	instrument receive data
3	TXD	instrument send data
5	GND	Signal Ground

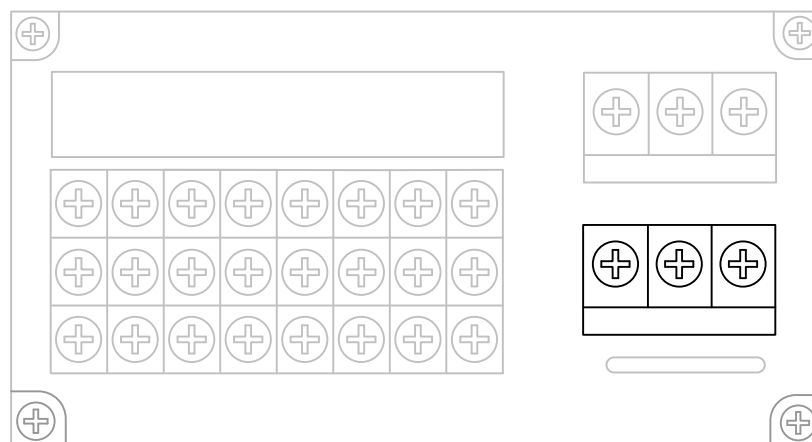
RS232C connection



RS485's position in the rear instrument

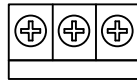


KT100S



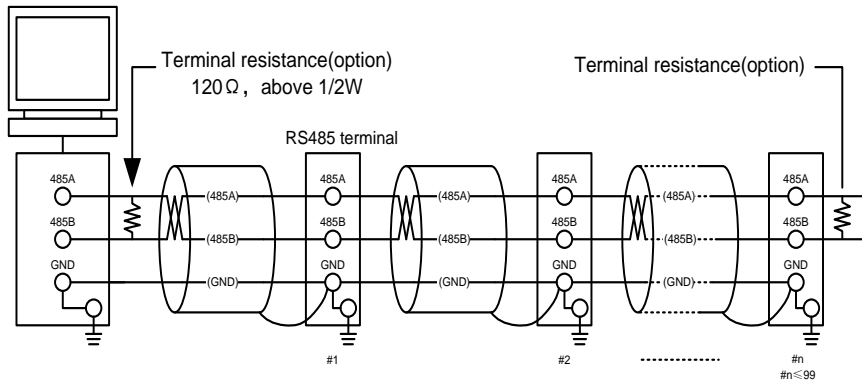
KT100H

Terminal Arrangement



A B GND

RS485connection



Don't connect terminal resistance between #1 and #n-1

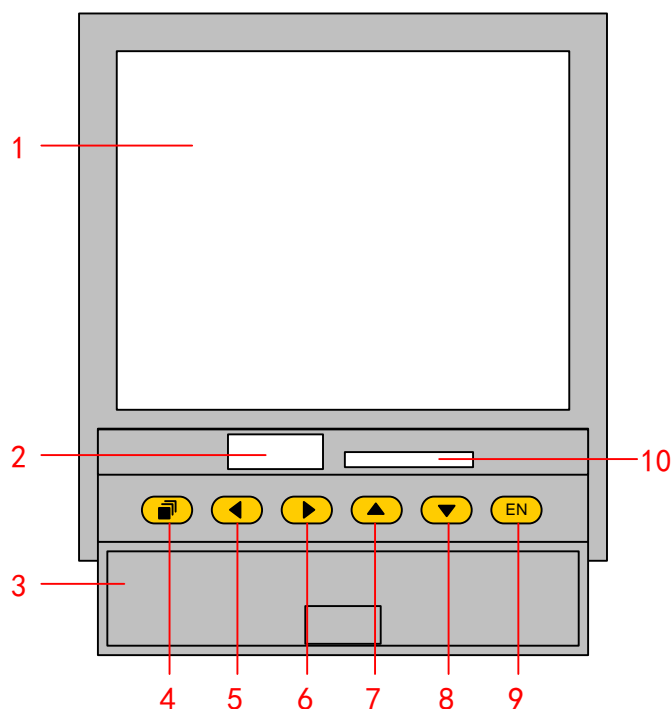
Communication Specifications

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)

CHAPTER 3 NAMES OF PARTS/RUN MODE/COMMON KEY OPERATIONS

3.1 NAMES OF PARTS AND FUNCTIONS

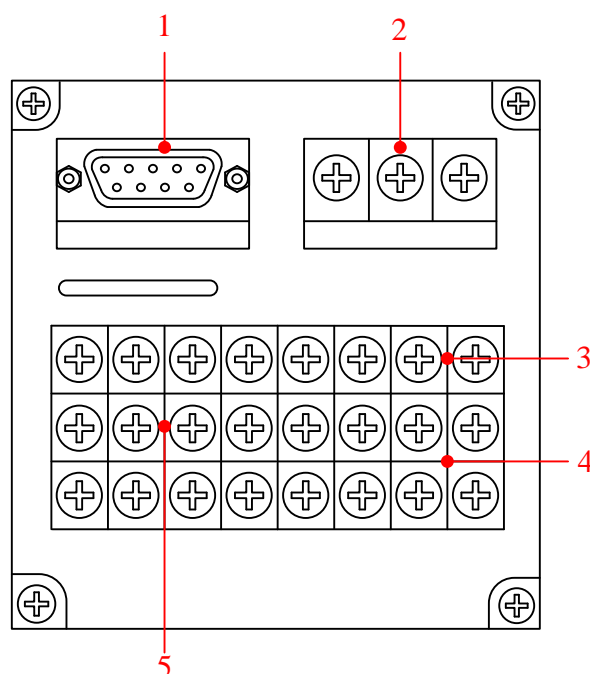
Front Panel



- 1. LCD Screen**
Display various operation screens such as the trend display and the setup screen to configure the instrument.
- 2. USB port**
USB port, insert the U disk to backup data for use.
- 3. Front Cover**
Open this cover to access the keys or inserting or removing the external storage medium such as the USB disk. Keep the cover closed at all times except when accessing the keys and the external storage medium.
- 4. PAGE key**
Used to switching operation display. Press this key down with ENTER key at the same time will becoming a combination key, which is used to enter the setting mode.
- 5. LEFT key**
Used to move cursor to left in run mode and setting mode, used to search forward.
- 6. RIGHT key**
Used to move cursor to right in run mode and setting mode, used to search afterward.

7. **UP key**
Used to increase the value that cursor indicated, and switches channels on the screen.
8. **DOWN key**
Used to decrease the value that cursor indicated, and switches compress ratio on the screen.
9. **ENTER key**
Used to execute the function of button that cursor indicated. It also display the input keypad when the value that cursor indicated can be edited. On history trend screen, you can switch replay mode between continuous time mode and select time mode. Enter configuration screen by using Enter key and Page key.
10. **SD card port**
Used in automatic backup and data backup.

Rear Panel



1. **RS232 Port and RS485 Port**
RS-232 port/ RS485 port is used to connect the interface cable.
2. **Power terminals**
Connect the power cord and ground protective line.
3. **24 VDC Power Supply for Transmitter**
Provide 24 VDC power line to transmitters.
4. **Relay output terminals**
Connect the relay output alarm cable.
5. **I/O signal terminals**
Connect the input signal cable of the item being measured or output signal cable of analog current.

Note: For the details, please refer to 『 Before using the instrument 』 chapter.

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.

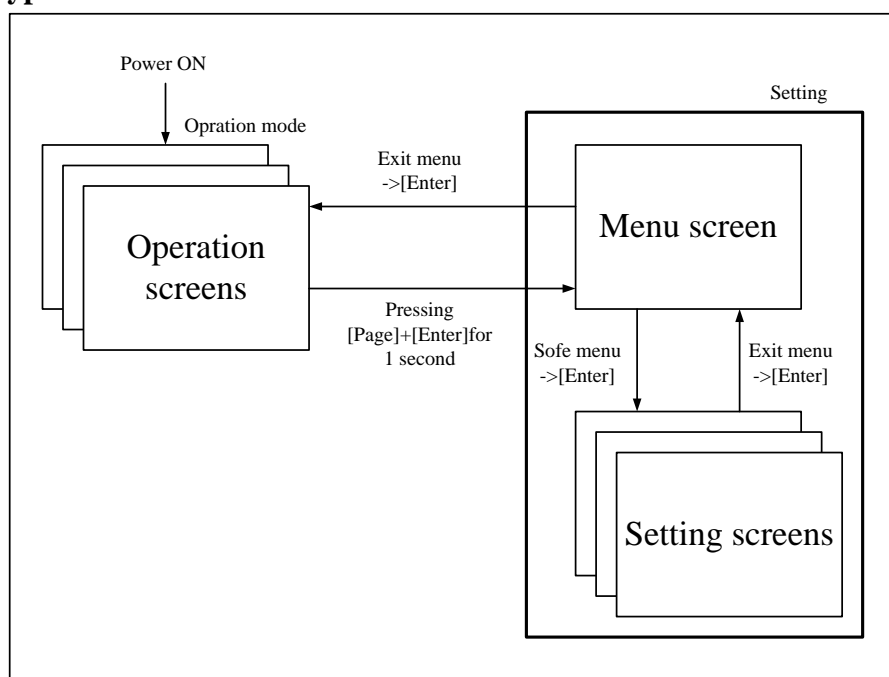
Specification

Item	Content
USB port	Support the USB 2.0 protocol. The maximum capacity is 4GB
SD card port	Standard SD card, don't support SDHC card. The maximum capacity is 2GB

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.	<ul style="list-style-type: none"> ● 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.	<ul style="list-style-type: none"> ● 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 recording parameters
- Setting signal input parameters
- Setting alarm parameters
- Setting analog output parameters
- Setting accumulation and reports parameters
- Setting communication parameters
- Setting display parameters
- Setting print parameters
- Clearing data in the instrument

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.

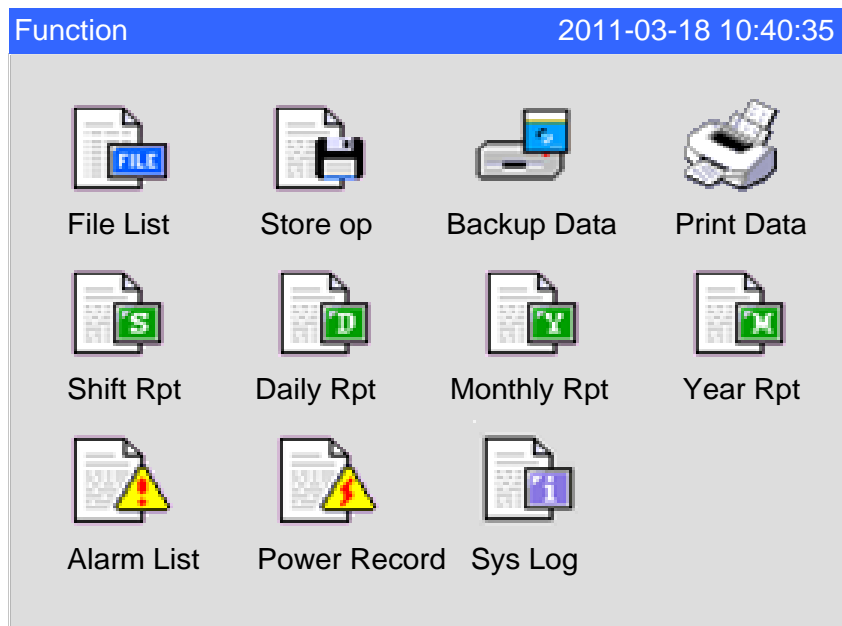
Switching the screens under the running mode

Press [Page] to display each running screen in turn.

Key operations in the function screen

Entering the function screen

In the running mode, press [Page] to switch to the function screen.



Select Function screen

1. Use the [left and right button] to move the cursor
2. Use the [Enter] to enter the corresponding screen

File List		2011-03-18 10:12:24			
Index	From	To	Status		
→ 001	11-03-17 16:20:11	11-03-17 17:53:24	Recording		
002	11-03-16 18:13:55	11-03-17 16:16:25	ManualOff		
003	11-03-15 16:12:18	11-03-16 16:15:35	Power Off		

Total:3 Menu

Key operation in the menu bar

Use [Enter] to start menu bar, click the button corresponding to the menu name to perform the operation.

File List		2011-03-18 17:53:24			
Index	From	To	Status		
→ 001	11-03-17 16:20:11	11-03-17 17:53:24	Recording		
002	11-03-16 18:13:55	11-03-17 16:16:25	ManualOff		
003	11-03-15 16:12:18	11-03-16 16:15:35	Power Off		

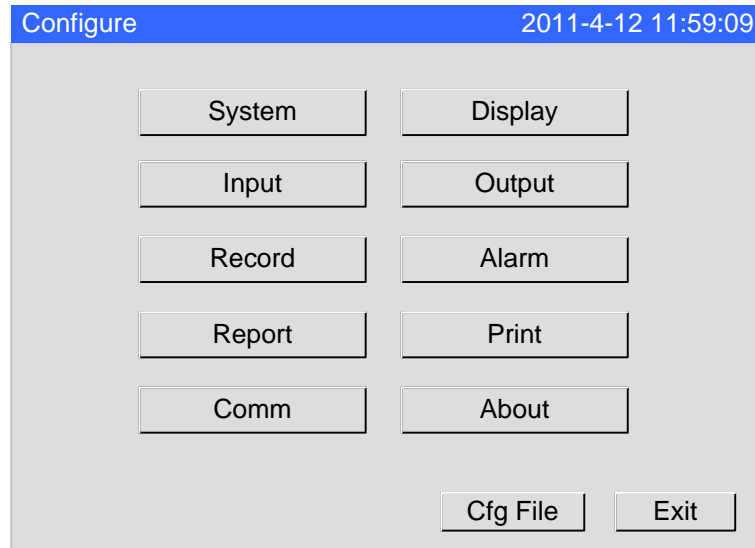
Tot Trend Backup Print Exit

📄
⏪
⏩
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⏵
EN

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 each configuration screen.



Selecting the parameter

Used [Left] and [Right] to move the cursor (blue) to the appropriate parameter or operation key.

Confirming operation

Press [Enter] to confirm the settings.

Modifying the parameter

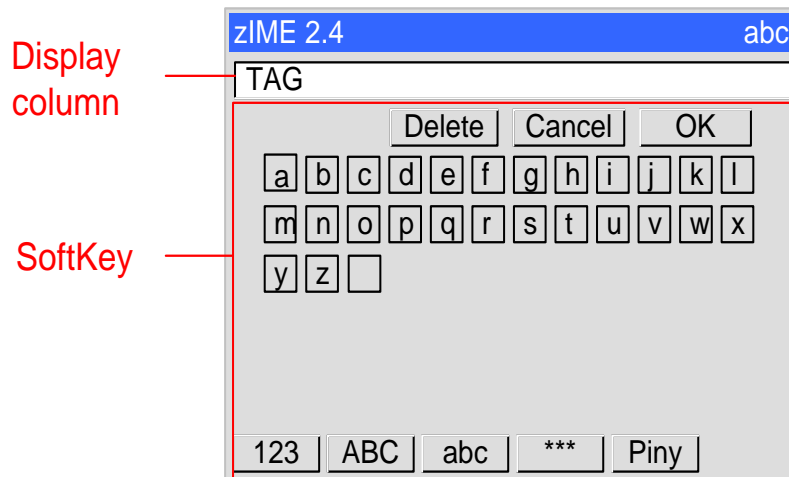
There are three types of the revisable parameters, namely, to adjust the input parameters, edit the input parameters and select input parameters.

- 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 subtly 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]: Move the cursor to the soft key or input method (including function, Pinyin Chinese character input method).

[Up][Down]: Switch accent characters when the cursor is in the alphabet characters,

[Page]: Switch the cursor's to **[En]** key if there is no Pinyin. 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.

Cursor at **[Delete]**: Delete the last character in the input field.

Cursor at **[Cancel]**: Exit the input panel, cancel the editing.

Cursor at **[Enter]**: Exit the input panel, confirm the editing.

If the cursor is at the input method area, you can switch it to the soft key area.

Examples

Revise unit to " m³ / 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 "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

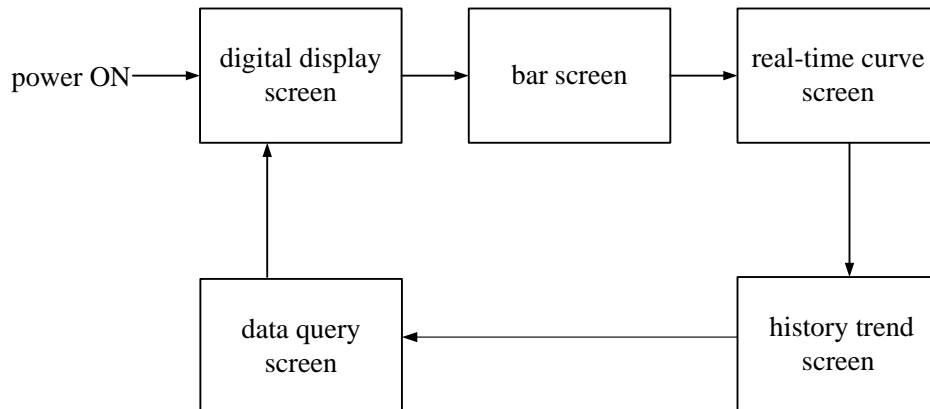
4.1 SWITCHING OPERATION SCREENS.

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.

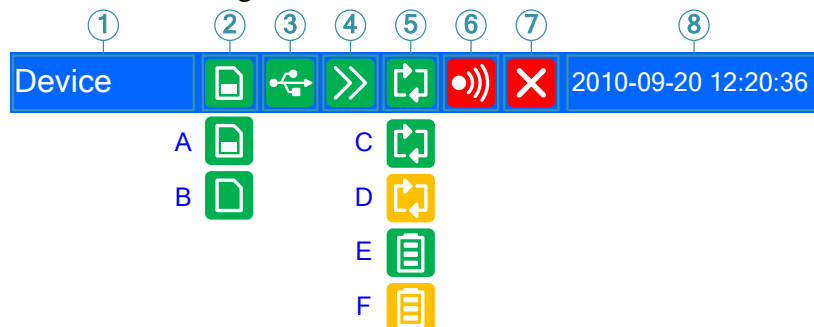
Alarm summary, data print (additional function) and backup (additional function), the cumulative report (additional specification) , power-down recording and system logs and other screens enter through the data query screen.

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 SD card connection fails.

3. USB Device Identification

Display: There are USB devices and instrumentation connections.

No Show: No USB devices and instrumentation connections or connection fails.

4. Circulation display flag

Circulation icon: Circulation Display each group

None: Fixed screen, there is no circulation.

5. Storage recording mode flag

C icon: recording mode is circular, and the file is recording

D icon: recording mode is circular, and the file stops recording

E icon: record mode is not circular, and the file is recording

F icon: 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.

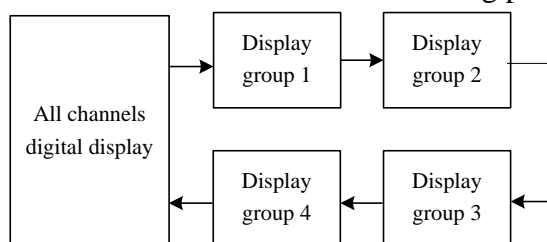
8. Current data and time

4.3 DIGITAL DISPLAY SCREEN

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

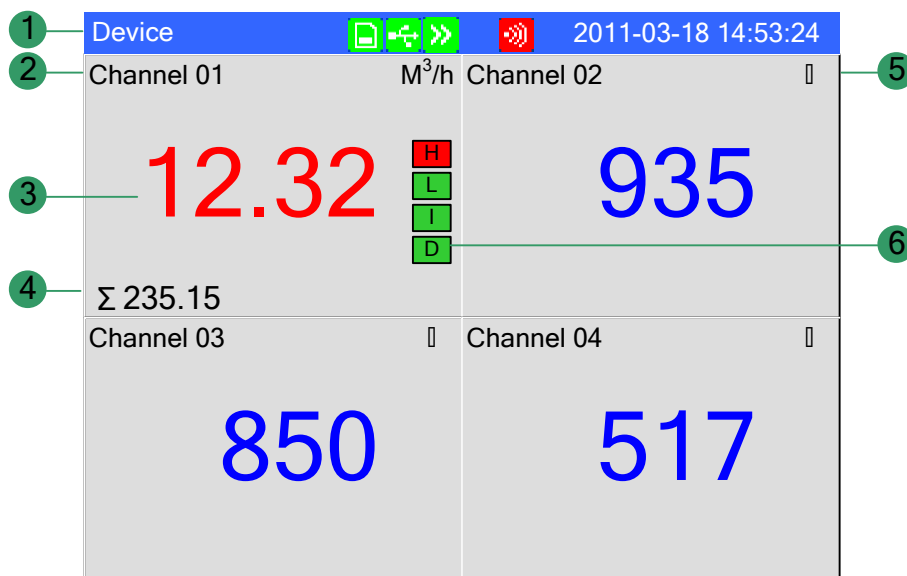
Use [up and down keys] to switch displayed combinations. It can display up to 4 combinations. If display of combinations don't show configuration, skip this display combinations.

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 displays as follows:



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. 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 bellow 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.

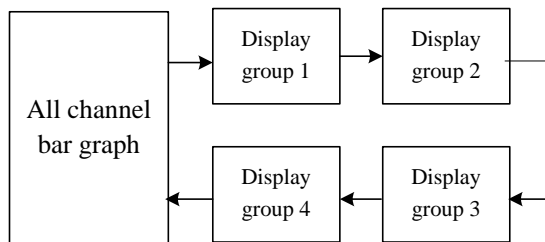
4. Channel accumulation value. It displays when the user selects [channel accumulated] function.
5. Channel unit can be set. With regard to setting method, see section 『Channel Tag and Unit Setting』
6. Alarm symbol. 4-channel alarm can be set up, Green is normal, red is alarm.

4.4 BAR GRAPH DISPLAY

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

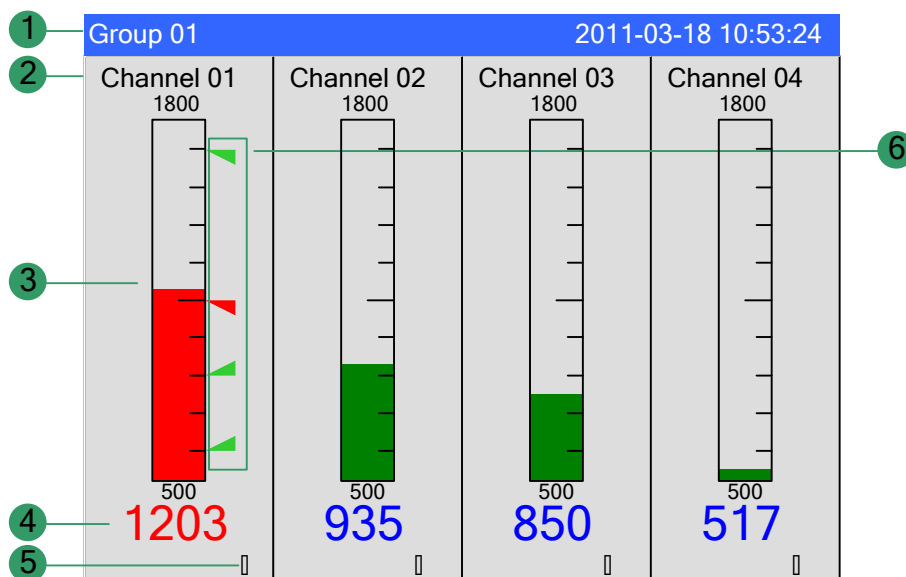
Using [up and down keys] to switch combinations of display. It can display up to 4 combinations. If display of combinations don't show configuration, skip this display combinations.

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

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

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

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

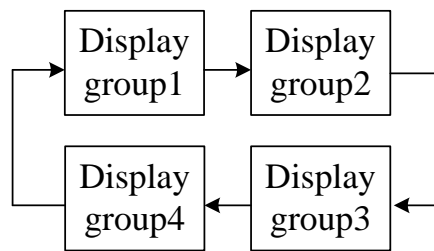
5. Channel unit can be set. With regard to setting method, see section 『Channel Tag and Unit Setting』
6. Alarm symbol. 4-channel alarm can be set up, green is normal, red is alarm. The place in which the warning signs are located in the bar is where the alarm sets limits in the range of the position, 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 4-channel has circular display according to the order of combination of channels.

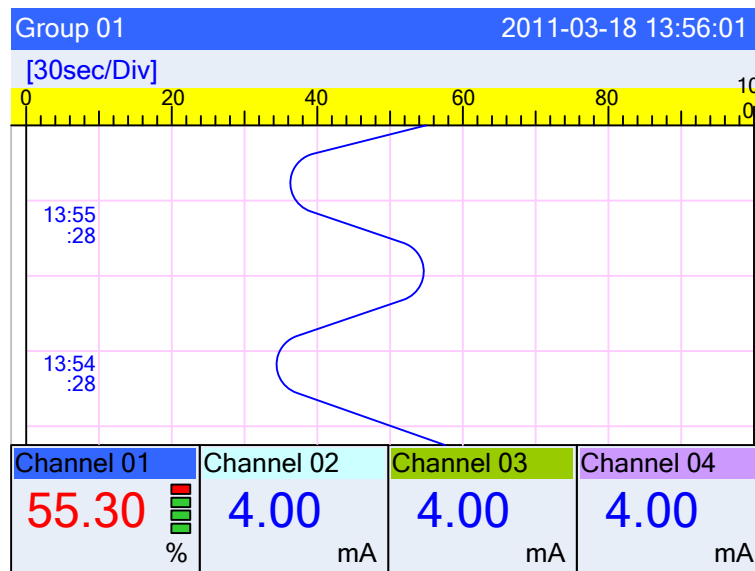
- Combined mode of curve cycle



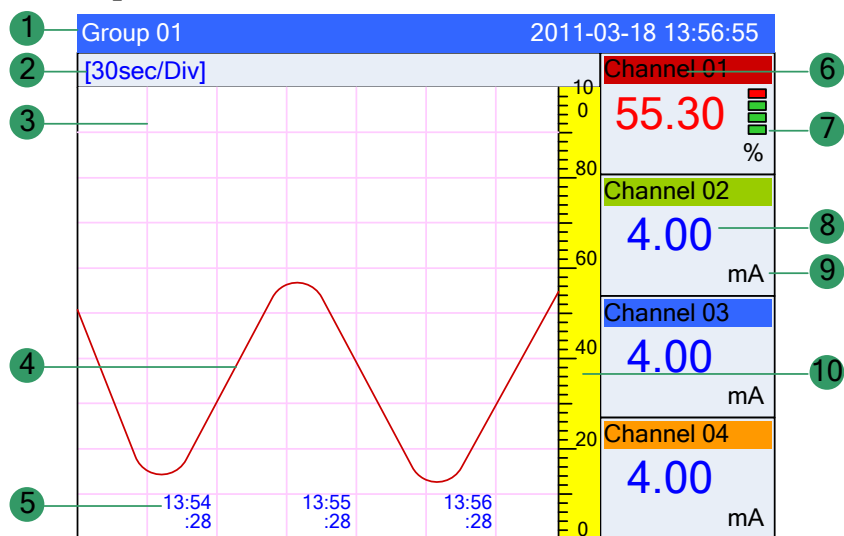
- Uncombined model of curve cycle

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 × 30.
3. Grid. Estimate the time and data value.
4. Data trend. Most display 4 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 in the bar is where the alarm sets limits in the range of the position, which is only effective against H/L alarm.
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 resistance 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

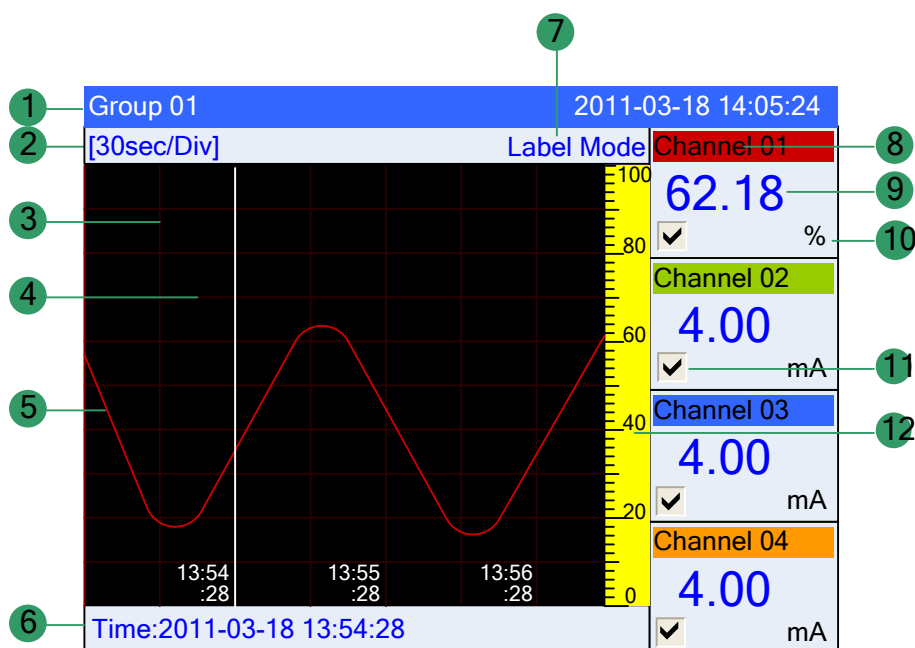
Display the measured / operated data stored in the memory with historical curve.

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 × 30.
3. Grid. Estimate the time and data value.
4. Searching stick. Estimate the time and data value.
5. Data trend. Most display 4 trends at the same screen.
6. Searching time. Show the time where the cursor is located in the trend.
7. There exist two methods to search historical data. One is searching mode and the other is cursor mode.
8. 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.
9. Historical data of channels. Show the data of channels that the Meter recorded.
10. Channel unit can be set. With regard to setting method, see section 『Channel Tag and Unit Setting』
11. Trend display symbol. “√” display, “×” hide.

12. Scale. Display the percentage the trend.

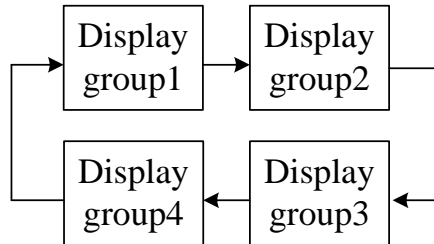
Procedure:

- Cursor searching mode

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 4-channel has circular display according to the order of combination of channels.

Combined cycle mode of curve



Cursor searching mode operation

Uses [Left] and [Right] to move cursor so that forward or backward searching is available. Long press [left and right 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

Operation of searching mode

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, and the searching point will at the right side 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.

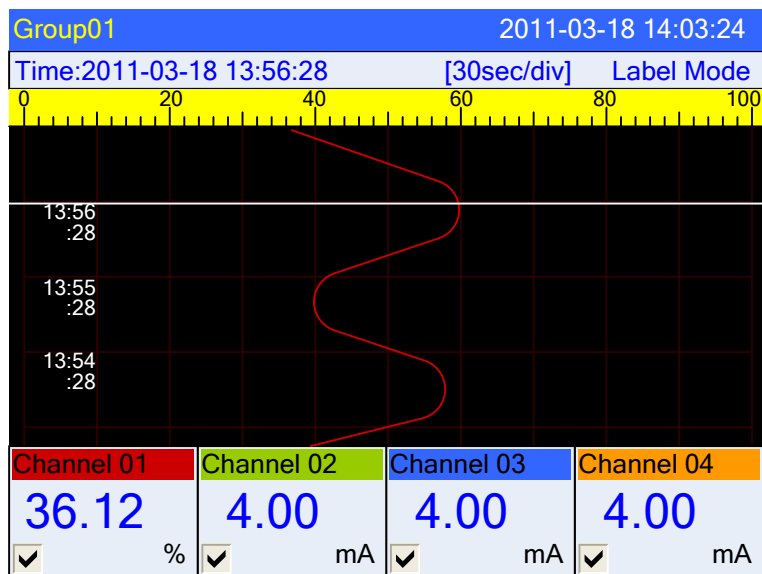
Show or hide a curve

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.

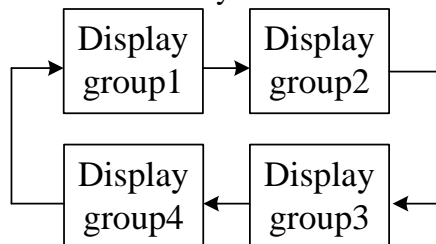
Longitudinal history curve



Procedure:

- Cursor searching mode
- 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 4-channel has circular display according to the order of combination of channels.

Combined mode of curve cycle



Non-combined mode with no curve cycle

Cursor searching mode

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.

- Operation of searching mode
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

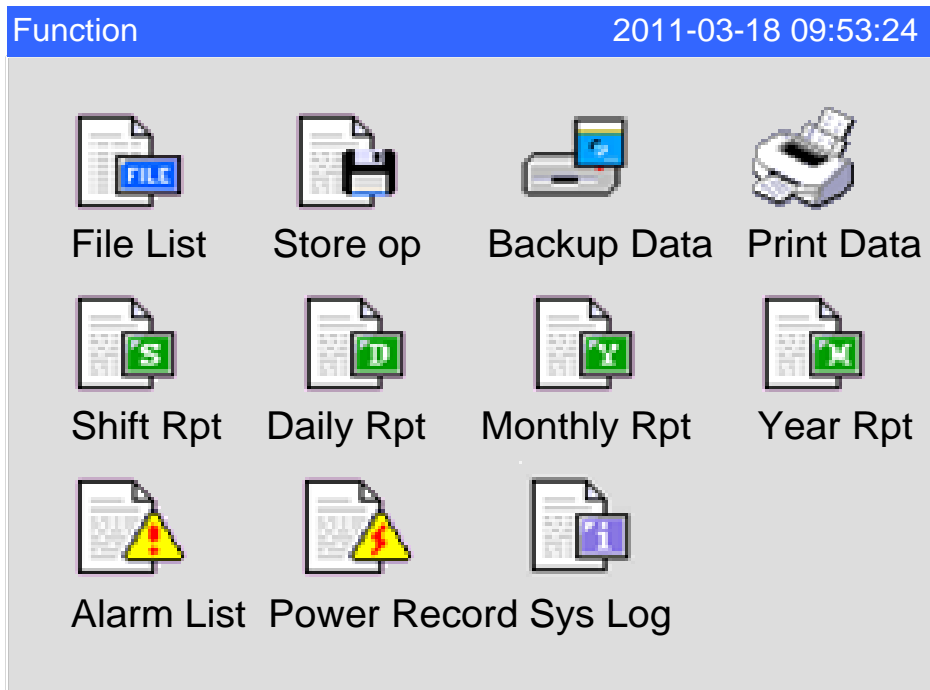
Use [Left] [Right] to move the cursor to the curve show / hide, press [Up] or [down], you can hide or show the curve.

Switch the continuous state and the fixed point state

Press [En] to switch to the fixed point state.

4.7 FUNCTION SCREEN

The entrance of backup, printing and viewing for the instrument internal data (historical data, alarm list, accumulation, accumulative reports, power-down recording and system logs)



Operation:

Use [left and right button] to move the cursor

Use [Enter] to enter the corresponding screen

4.8 FILE LIST

Show file storage and file storage status information.

For the display method, please refer to the section 『 switch run screen 』

File List		2011-03- 18 17:53:24		
Index	From	To	Status	
➔ 001	11-03- 17 16:20:11	11-03- 17 17:53:24	Recording	
002	11-03- 16 18:13:55	11-03- 17 16:16:23	ManualOff	
003	11-03- 15 16:12:18	11-03- 16 16:15:25	Power Off	

Total:3 Menu

1. Number: Record is arranged by time, the near the occurrence time is, the more preceding it will be arranged.
2. Starting time: the starting time of data record in files.
3. End time: the end time of data record in files.
4. Status: Display the current state of file records, which is as follows:
Being recorded: the file is recording data;
Manually stopped: file stops recording because of changes in the configuration data or manually key operation;
Power-down stopped: file stops recording due to the power -down
Alarm stopped: the file stops recording due to the cancellation of reports;
Switch stopped: the file stops recording because of the disconnection of external switching device;
Time stopped: the file stops because it reaches the setting time for the end of record.
5. Menu: Use the [up and down keys] to move to the file number you want to view, use the [Enter] to enter: Press [trend] to skip to the historical trend screen and view the historical trend data, then use the [page] to return to the file list screen; press [backup] to skip to the history data backup screen for a single file in order to back up the historical data for single files, use the [Page] to return to the file list screen; Press [Exit] to return to the current file list screen.

4.9 STORAGE OPERATION

Display configuration setting and file storage information. For the recording configuration setting, please refer to the section 『 record configuration』 .
For the display method, please refer to the section 『switch run screen』

The screenshot shows a configuration window titled "Store op" with a timestamp of "2011-04-12 12:25:16". The window contains three main sections, each highlighted with a red box and a number:

- 1:** Configuration settings including "Record Mode" (Cyclic), "Rcd Interval" (1 sec), and "Trigger Event" (Manual).
- 2:** Time range settings including "From" (2010-4-12 00:00:07) and "To" (2010-4-12 11:59:09).
- 3:** A "Menu" button located at the bottom right of the window.

1. The instrument records the configuration information.
2. The start time and end time of Instrument file storage.
3. Menu: When the trigger is set to record the configuration manually, use the [Enter] to enter: Press [Start], the instrument will start recording; Press [Stop] , the instrument wil stop recording.

Note: The display of storage interface varies according to the different record configuration settings.

4.10 DATA BACKUP

This section describes how to use the U disk and SD card to back up historical data.

For the display method, please refer to the section 【switch run screen】

Backup Data		2011-03-18 14:53:24
Backup Content	All History Files	▼
File Folder Name	20110318.005	
<input type="button" value="Backup(USB)"/>		
<input type="button" value="Backup(SD)"/>		
Backup finished.		

Backup Data		2011-03-18 08:53:24
Backup Content	Single History File	▼
File Name	DAT00000.RDZ	
File Index	3	▲▼
From	2009-9-17 08:04:32	
To	2009-9-17 11:20:12	
<input type="button" value="Backup(USB)"/>		
<input type="button" value="Backup(SD)"/>		
Backup finished.		

Operation procedure:

1. Properly connect U disk or SD card, and there is a corresponding icon in the system bar after connection.
2. Use [up and down keys] to select the backup contents, including all historical data, historical data of single file, alarm record, power-down record, the system log, accumulative shfit report, accumulative daily report, accumulative monthly report and accumulative annual report.
3. When backing up the historical data of 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] to edit the file name.
5. Back up data, move the cursor to **【backup (USB)】** or **【backup (SD)】** button, press [Enter] to implement data backup.
6. Back up all historical data , file storage path is / DATA/ **【device name】** / folder name; back up other data , file storage path is / DATA/ **【device name】** / file name. For the **【device name】**, please check the system configuration screen.
7. Use the [Page] to return to data query screen

4.11 DATA PRINTING

This section describes how to use the mini-printer to print historical data. For the display method, please refer to the section 【switch run screen】

The screenshot shows a software interface titled "Print Data" with a timestamp "2011-03-18 15:53:24". The interface includes the following fields and controls:

- From:** 2009-09-14 10:21:59
- To:** 2009-09-17 11:06:02
- Channel:** Channel 01 (dropdown menu)
- Interval:** 1 (spinner)
- File Index:** 1 (spinner)

At the bottom right, there are two buttons: "Print Data" and "Print Curve". A status bar at the bottom left displays "Print finished."

Printing steps:

1. Micro printer is properly connected.
2. Set a start time and end time.
3. Set the print channel and the print interval.
4. Print the trend or data.
5. Use the [Page] to return to data query screen.

Specification

Instrument and the printer is connected through the RS232C Interface (DB9) .

Instrument interface	micro printer interface
RXD	RTS
TXD	RXD
GND	GND

Instrument does not need to set 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』

Alarm List					2011-03-18 19:53:24
Index	Status	Chnl	Type	Time	
001	ON	01	2 L	2011-03-18 16:17:35	
002	OFF	02	1 H	2011-03-18 16:10:23	
003	ON	02	1 H	2011-03-18 15:45:22	
004	OFF	02	2 L	2011-03-18 15:35:45	
005	ON	02	2 L	2011-03-18 15:23:36	
006	OFF	01	1 H	2011-03-18 15:12:10	
007	ON	01	1 H	2011-03-18 15:02:03	
008	OFF	01	2 L	2011-03-18 14:57:52	
009	ON	01	2 L	2011-03-18 14:42:24	
010	OFF	03	1 H	2011-03-18 14:23:09	
011	ON	03	1 H	2011-03-18 14:07:00	
012	OFF	01	2 L	2011-03-18 11:06:50	

<67> 01 02 Menu

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
Green	open
Red	close

7. Menu: Use the [Enter] to enter: Press [Backup] to skip 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 SHIFT REPORT

According to the configuration to set shift report and time, display accumulative shift report namely the cumulative amount of each shift, generated reports on a daily basis.

If there's no cumulative channel or number of shift report, the entrance to shift report does not provide.

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

The screenshot shows a terminal window titled "Shift Rpt" with a timestamp of "2011-03-18 12:53:24". At the top, there are two dropdown menus: "Channel" set to "Channel 01" and "Date" set to "2011-03-18". Below these, the report data for "2011-03-18:" is displayed as follows:

A	8498.60
B	202.10
C	0.00

At the bottom left, the total cumulative amount is shown as "Σ 8700.70". At the bottom right, there is a "Menu" button.

Operation:

Channels: use [up and down keys] to modify the channel.

Date: Use the [up and down keys] to modify the query start date; use the [En] to start query.

Menu: Use the [Enter] to enter: Press [backup] to skip to the data backup screen for accumulative shift report backup; Press [Print] to use mini-printer for printing the content of the screen display; Press [Exit] to return to the current accumulative shift report screen.

Use [Page] to return to data query screen.

4.14 ACCUMULATIVE DAILY REPORT

Show the cumulative daily report, namely the cumulative amount per hour, and generate daily report per day.

If there's no cumulative channel, the entrance to daily report does not provide.

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

Daily Rpt		2011-03-18 12:53:24	
Channel	Channel 01	Date	2011-03-17
01:	1.00	13:	1.00
02:	1.00	14:	1.00
03:	1.00	15:	1.00
04:	1.00	16:	1.00
05:	1.00	17:	1.00
06:	1.00	18:	1.00
07:	1.00	19:	1.00
08:	1.00	20:	1.00
09:	1.00	21:	1.00
10:	1.00	22:	1.00
11:	1.00	23:	1.00
12:	1.00	24:	1.00
Σ114108.84		Sum:24.00	

Operation:

Channels: use [up and down keys] to modify the channel.

Date: Use the [up and down keys] to modify the query start date; use the [En] to start query.

Menu: Use the [Enter] to enter: Press [backup] to skip to the data backup screen for accumulative daily report backup; Press [Print] to use mini-printer to print the content of screen display; Press [Exit] to return to the current accumulative daily report screen.

Total: Display the total volume per day.

Use [Page Down] to return to data query screen.

4.15 ACCUMULATIVE MONTHLY REPORT

Show the cumulative monthly report, namely a daily cumulative amount, and generate reports on a monthly basis.

If there's no cumulative channel, the entrance to monthly report does not provide.

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

Monthly Rpt		2011-03-18 13:53:24	
Channel	Channel 01	Time	2011-02
01: 0.00	12: 0.00	23: 0.00	
02: 0.00	13: 0.00	24: 0.00	
03: 0.00	14: 0.00	25: 0.00	
04: 0.00	15: 0.00	26: 4.55	
05: 0.00	16: 0.00	27: 0.00	
06: 0.00	17: 0.00	28: 7.86	
07: 0.00	18: 0.00		
08: 0.00	19: 0.00		
09: 0.00	20: 0.00		
10: 0.00	21: 0.00		
11: 0.00	22: 0.00		
Σ125.07		Sum:12.41	
			Menu

Operation:

Channels: use [up and down keys] to modify the channel.

Date: Use the [up and down keys] to modify the query start date; use the [En] to start query.

Menu: Use the [Enter] to enter: Press [backup] to skip to the data backup screen for the accumulative monthly report backup; Press [Print] to use the mini-printer for printing the content of the screen display; Press [Exit] to return to the current accumulative monthly report screen.

Total: Display the total volume per month.

Use [Page] to return to data query screen.

4.16 ACCUMULATIVE ANNUAL REPORT

Show cumulative annual report, namely the cumulative monthly amount. If there's no cumulative channel, the entrance to monthly report does not provide. On the way to display, please see the section 『switching the running screen』

Year Rpt		2011-03-18 15:53:24	
Channel	Channel 01	Time	2009
2009-01:	0.00		
2009-02:	3.88		
2009-03:	2.13		
2009-04:	0.00		
2009-05:	0.00		
2009-06:	0.00		
2009-07:	0.00		
2009-08:	0.00		
2009-09:	0.00		
2009-10:	0.00		
2009-11:	0.00		
2009-12:	0.00		
Σ6.01		Sum:6.01	Menu

Operation:

Channels: use [up and down keys] to modify the channel.

Menu: Use the [Enter] to enter: Press [backsp] to skip to the data backup screen for the accumulative annual report backup; Press [Print] to use the mini-printer for printing the content of the screen display; Press [Exit] to return to the current accumulative annual report screen.

Total: Display the total volume per year.

Use [Page] to return to data query screen.

4.17 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』

Power Record		2011-05-27 08:48:24
Index	Power off	Power on
001	2011-05-27 08:47:27	2011-05-27 08:47:37
002	2011-05-26 17:21:49	2011-05-27 08:42:09
003	2011-05-26 17:14:46	2011-05-26 17:14:50

Total:3 ShutDown: 3Times/0d15h20m34s

Channel sequence number: Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.

Power-down time: Power-down time of the Instrument.

Power-on time: power-on time of the Instrument.

Total number of power-down: the total number of power-down records, accumulate time for each power-down time.

Menu: Use the [Enter] to enter: Press [backup] to skip to the data backup screen for power-down record backup; Press [Exit] to return to the current power-down record screen.

Use [left or right button] or [up and down keys] to inquire on next page

Use [Page] to return to data query screen.

4.18 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.

Sys Log		2011-05-27 09:53:24
Index	Event	Time
001	Clear Data	2011-05-26 17:14:32
002	Enter Config	2011-05-26 15:14:02
003	Save Display config	2011-05-26 12:24:55
004	Enter Config	2011-05-26 12:14:42
005	Enter Config	2011-05-26 10:53:23
006	Enter Config	2011-05-26 10:14:12
007	Save Report config	2011-05-26 09:33:11
008	Enter Config	2011-05-26 09:32:32
009	Save Input config	2011-05-26 09:14:53
010	Enter Config	2011-05-25 17:54:32
011	Factory Set	2011-05-25 17:14:42
012	Enter Config	2011-05-25 14:25:25
Total:21		Menu

Channel sequence number: Records are arranged according to the stack, the closer time of occurrence is, the more pre-arranged it is.

Event: Operation event.

Time of occurrence: The incident occurred.

Menu: Use the [Enter] to enter: Press [backup] to skip to the data backup screen for system log backup; Press [Exit] to return to the current system log screen.

4.19 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.

The image displays two screenshots of a device's configuration interface. The top screenshot is titled 'Login' and shows a password field with the text '000000' and a small dropdown arrow. Below the password field is an 'Exit' button. The bottom screenshot is titled 'Configure' and shows a grid of buttons for various configuration options: System, Display, Input, Output, Record, Alarm, Report, Print, Comm, and About. At the bottom of the 'Configure' screen are two buttons: 'Cfg File' and 'Exit'. Both screenshots show a date and time in the top right corner: '2011-4-25 11:59:09' for the login screen and '2010-4-12 11:59:09' for the configure screen. A red status bar at the bottom of the login screen displays 'R1GV1000 11/04/25' and '[PN100222]'.

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 Running Date / Time

Procedure

Enter **【system configuration】** screen, the method to enter please see “log configuration”.

The screenshot shows a 'System' configuration screen with a blue header bar displaying 'System' and the current date and time '2011-05-27 10:07:09'. Below the header, there are several configuration fields: 'Alias' (text input), 'System time' (date and time dropdown), 'Language' (dropdown menu), 'Password' (text input), and 'CoolMode' (dropdown menu with a temperature value of 26.3). At the bottom of the screen, there are three buttons: 'Factory-set', 'Clear Data', and 'Exit'.

Date Time: This field is set meter run 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 **【Cancel】** 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 backup history data.

After setting system date/ time, please purge the data.

5.2 SETTING THE NAME

Set the device name; display it on the title bar.

Use that name to create the directory of data backup and automatic backup to.

Operation

Enter **【system configuration screen】**, the method to enter please see “log configuration”.

The screenshot shows a system configuration interface. At the top, there is a blue header bar with the text 'System' on the left and '2011-05-27 10:07:09' on the right. Below the header, there are several configuration items, each with a label on the left and a corresponding input field on the right:

- Alias**: A text input field containing the word 'Alias'.
- System time**: A time selection field showing '2011-05-27 10:07:09' with a small downward arrow on the right.
- Language**: A dropdown menu showing 'Chinese' with a small downward arrow on the right.
- Password**: A password input field showing '000000' with a small downward arrow on the right.
- CoolMode**: A dropdown menu showing 'Auto' with a small downward arrow on the right, followed by a temperature input field showing '26.3' with a small downward arrow on the right.

At the bottom of the screen, there are three buttons: 'Factory-set' and 'Clear Data' are positioned side-by-side in the center, and 'Exit' is positioned in the bottom right corner.

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”.

The screenshot shows a 'System' configuration screen with a blue header bar containing the text 'System' and '2011-05-27 10:07:09'. Below the header, there are five rows of configuration options, each with a label on the left and a control element on the right:

- Alias**: A text input field containing 'Alias'.
- System time**: A dropdown menu showing '2011-05-27 10:07:09'.
- Language**: A dropdown menu showing 'Chinese'.
- Password**: A dropdown menu showing '000000'.
- CoolMode**: A dropdown menu showing 'Auto' and a numeric input field showing '26.3'.

At the bottom of the screen, there are three buttons: 'Factory-set', 'Clear Data', and 'Exit'.

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”.

The screenshot shows a system configuration interface with a blue header bar containing the text "System" and "2011-05-27 10:07:09". Below the header, there are five rows of settings, each with a label on the left and a control element on the right:

- Alias**: A text input field containing "Alias".
- System time**: A dropdown menu showing "2011-05-27 10:07:09".
- Language**: A dropdown menu showing "Chinese".
- Password**: A dropdown menu showing "000000".
- CoolMode**: Two dropdown menus, the first showing "Auto" and the second showing "26.3".

At the bottom of the screen, there are three buttons: "Factory-set", "Clear Data", and "Exit".

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 REFERENCE JUNCTION COMPENSATION

Reference junction compensation can tune compensation temperature value of thermocouple (Range:±10°C)

Operation

Enter **【system configuration screen】** , the method to enter please see “log configuration”.

The screenshot shows a 'System' configuration screen with a blue header bar containing the text 'System' and the date/time '2011-05-27 10:07:09'. Below the header, there are several configuration fields: 'Alias' with a text input field containing 'Alias'; 'System time' with a dropdown menu showing '2011-05-27 10:07:09'; 'Language' with a dropdown menu showing 'Chinese'; 'Password' with a dropdown menu showing '000000'; and 'CoolMode' with two dropdown menus, the first showing 'Auto' and the second showing '26.3'. At the bottom of the screen, there are three buttons: 'Factory-set', 'Clear Data', and 'Exit'.

RJC adjustment: the column is used to set the RJC.

1. Use the [left and right button] to move the cursor to the **【Coldmode】** column.
2. The cold junction temperature sampling has two modes:
 - a) Automatic: the instrument will collect the terminal temperature by its own temperature sensor, use the [left and right button] to move the cursor to the **【temperature】** , use [up and down button] to adjust the value of the reference junction. Adjustment range: ± 10 °C .
 - b) Manual: the user sets the current terminal temperature, and the instrument will implement various calculations according to the user settings, such as: thermocouple reference junction compensation, etc. Temperature range : -25 ~ 125 °C.
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.

The initialization of the factory settings will remove all configuration information and all the stored data in the memory of the instrument other than the system log , including historical data, the total accumulation, accumulative reports, alarm list, power-down record.

Operation

Enter **【system configuration screen】** , the method to enter please see “log configuration”.

The screenshot shows a 'System' configuration window with a blue header bar containing the title 'System' and the timestamp '2011-05-27 10:07:09'. The main area is light gray and contains several settings:

- Alias**: A text input field containing 'Alias'.
- System time**: A dropdown menu showing '2011-05-27 10:07:09'.
- Language**: A dropdown menu showing 'Chinese'.
- Password**: A dropdown menu showing '000000'.
- CoolMode**: A dropdown menu showing 'Auto' and a numeric input field showing '26.3'.

At the bottom of the screen, there are three buttons: 'Factory-set', 'Clear Data', and 'Exit'.

1. Use the [left and right button] to move the cursor to the **【Factory setting】** column.
2. Use the [Enter] to implement the function of factory setting.
3. Confirming operation
After the parameter setting, select **【Exit】** there is a Frame.
Select **【Yes】** to implement the factory setting
Select **【No】** or **【Cancel】** to cancel factory setting.

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

Configuration	##	Parameter	Reset value	Notes
System configuration		Device name	Device name / Alias	The former in Chinese, the latter in English
		Date and time	unaffected	No change
		System language	unaffected	No change
		Password	000000	
		RJC	0.0	Displayed as the cold-side plus adjustment
Display configuration		Background color	white	
		Screen brightness	10	
		Trend direction	horizontal	
		First screen	Overview screen	
		Channel	OFF	
		Color	According to the index of trends	
Input configuration		Display tag	Channel xx / Channelxx	The former in Chinese, the latter in English
		Channel unit	%	
		Channel type	Current	
		Signal type	4-20mA	
		Decimal digits	2	
		Signal range	4.00 ~ 20.00	
		Display range	0.00 ~100.00	
		Adjust value K	1.00	
		Adjust value B	0.00	
		Burnout treatment	-.--	
		Filter	0.0 second	
		Small signal cut	0.0%	
Output configuration		Channel	OFF	
		Adjust value K	1.00	
		Adjust value B	0.00	
Record configuration		Record mode	Circular	
		Record type	Real-time value	
		Record interval	2 seconds	
		Automatic	NO	

		backup		
		Trigger	Power off	
Alarm configuration		Relay delay	0 second	
		Alarm hysteresis	0.00	
		I Alarm Time	1 second	
		R Alarm Time	1 second	
		Alarm type	OFF	
		Alarm value	0.00	
		Relay	OFF	
	Report configuration		Decimal digits	2
		Settlement time	00	
		Shift report number	3	
		Display tag	Shift A Shift B Shift C	
		Start time	00:30~08:30 08:30~16:30 16:30~00:30	
		Accumulation allowed	close	
		Initial value of accumulation	0.00	
		Magnification	1.00	
Print configuration		Key print	no	
		Timer print	no	
		Regular interval	00:02(H:M)	
Communication configuration		Communication address	001	
		Byte exchange	2-1 4-3	
		Baudrate	115200	
		Parity	No parity	

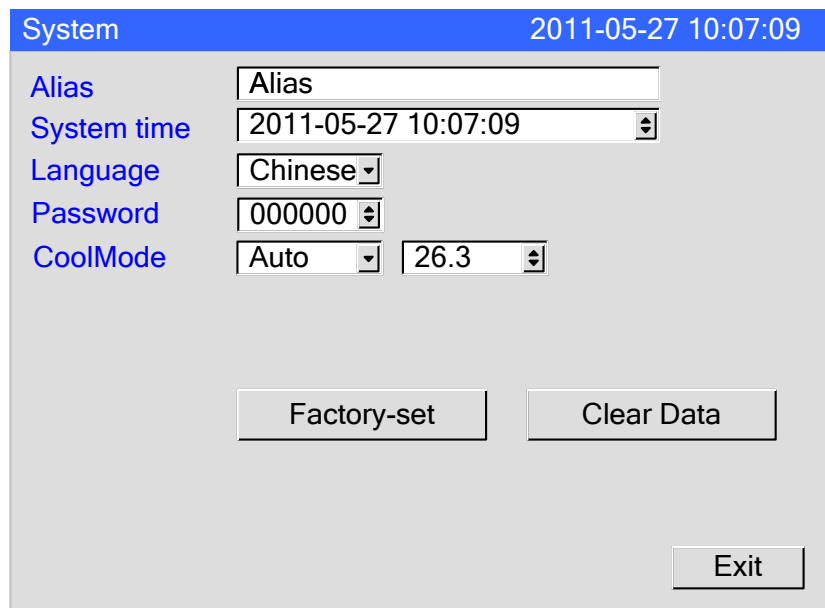
5.7 IMPLEMENTATION OF PURGING DATA

This section describes how to purge the record data in the instrument.

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”.



The screenshot shows a 'System' configuration screen with a blue header bar displaying 'System' and the date/time '2011-05-27 10:07:09'. Below the header, there are several configuration items, each with a label and a corresponding input field or dropdown menu:

- Alias**: A text input field containing 'Alias'.
- System time**: A dropdown menu showing '2011-05-27 10:07:09'.
- Language**: A dropdown menu showing 'Chinese'.
- Password**: A dropdown menu showing '000000'.
- CoolMode**: A dropdown menu showing 'Auto' and a numeric input field showing '26.3'.

At the bottom of the screen, there are three buttons: 'Factory-set', 'Clear Data', and 'Exit'.

1. Use the [left and right button] 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”.

The screenshot shows a configuration window titled "Record" with a timestamp "2011-4-12 11:59:09". The window contains several settings:

- Record Mode:** Cyclic
- Rcd Type:** Real
- Rcd Interval:** 1 sec
- Auto Backup:** checked
- Trigger Event:** Manual

At the bottom of the window, there are two buttons: "Purge record" and "Exit".

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.

NOTE

After modifying the record interval, the recording being stored will be interrupted.

6.2 SET UP THE WAY OF RECORDING

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”.

Record		2011-4-12 11:59:09	
Record Mode	Cyclic	Rcd Type	Real
Rcd Interval	1 sec	Auto Backup	<input checked="" type="checkbox"/>
Trigger Event	Manual		
		Purge record	Exit

Recording: This column is used to set recording method.

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 type: every day at 0:00, the instrument will automatically back up the historical data to SD card; when stopping recording or reaching the trigger conditions set by the user, the instrument will also 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 backup file storage directory: DATA / **【Device Name】** / instrument date (Year _ Month) / day / instrument time (hour _ minute second). RDZ

Operation:

Enter **【record configuration screen】**, the method to enter please see “log configuration”.

The screenshot shows a configuration window titled "Record" with a timestamp "2011-4-12 11:59:09". The settings are as follows:

Record Mode	Cyclic	Rcd Type	Real
Rcd Interval	1 sec	Auto Backup	<input checked="" type="checkbox"/>
Trigger Event	Manual		

At the bottom right, there are two buttons: "Purge record" and "Exit".

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 [Enter] 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 THE RECORD MODE

This section describes how to set the record mode of the instrument.

The record modes of the instrument have 2 types: circular and non-circular.

Circular: when the last recording file in the instrument is full, it will continue to record from the first paper, on the basis of replacing the old file by the new file to record the historical data circularly .

Non-circular: When the last record file in the instrument is full, it stops recording automatically

Operation:

Enter **【record configuration screen】**, the method to enter please see “log configuration”.

The screenshot shows a configuration window titled "Record" with a timestamp "2011-4-12 11:59:09". The window contains the following settings:

Record Mode	Cyclic	Rcd Type	Real
Rcd Interval	1 sec	Auto Backup	<input checked="" type="checkbox"/>
Trigger Event	Manual		

At the bottom of the window, there are two buttons: "Purge record" and "Exit".

1. Use the [left and right button] to move the cursor to **【Record Mode】** column.
2. Use the [up and down keys] to choose record mode: 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 [System] screen.
Select **【No】** to cancel setting content, and exit [System] screen.
Select **【Cancel】** to continue setting parameters in [System] screen.

6.5 SET THE TRIGGER

This section describes how to set trigger conditions.

The trigger includes manual trigger, alarm, relay, timing, power.

Manual: enter the instrument storage interface, you can manually start or stop the data storage records.

Alarm: can be set only in one channel when an alarm occurs, it starts recording data storage; when an alarm ends, then it stops recording.

Relay: can be set only in one channel corresponding to a relay in which an alarm occurs it starts data storage records; at the end of the relay alarm, it stops recording.

Timing: Timing cycle is fixed at 24 hours. Set start time and end time for the instrument so that it can only implement data storage records at the setting time.

Power: after the instrument is powered on to start, it will automatically create a new file and start recording data.

Operation:

Enter **【Record configuration screen】**, the method to enter please see “log configuration”.

The screenshot shows a configuration window titled "Record" with a timestamp "2011-4-12 11:59:09". The window contains several settings:

- Record Mode**: Cyclic (dropdown)
- Rcd Type**: Real (dropdown)
- Rcd Interval**: 1 sec (dropdown)
- Auto Backup**: checked (checkbox)
- Trigger Event**: Manual (dropdown)

At the bottom of the window, there are two buttons: "Purge record" and "Exit".

1. Use the [left and right button] to move the cursor to **【Trigger】** column.
2. Use the [up and down keys] to choose trigger condition.
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.

6.6 IMPLEMENT THE PURGING OF HISTORICAL DATA

This chapter describes how to purge the recording data in the instrument. Except system log, clear the historical data, the total accumulation, accumulative reports, alarm list, power-down record in the instrument memory.

Operation:

Enter **【record configuration screen】**, the method to enter please see “log configuration”.

The screenshot shows a configuration window titled "Record" with a timestamp "2011-4-12 11:59:09". The window contains several settings:

- Record Mode:** Cyclic
- Rcd Interval:** 1 sec
- Rcd Type:** Real
- Auto Backup:** checked (indicated by a checkmark in a box)
- Trigger Event:** Manual

At the bottom of the window, there are two buttons: "Purge record" and "Exit".

1. Use the [left and right button] to move the cursor to **【Purge historical record】** column.
2. Use the [up and down keys] to purge data.
3. Confirming operation
After the parameter setting, select **【Exit】** there is a Frame.
Select **【Yes】** to purge the data.
Select **【No】** or **【Cancel】** to cancel purging historical records.

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

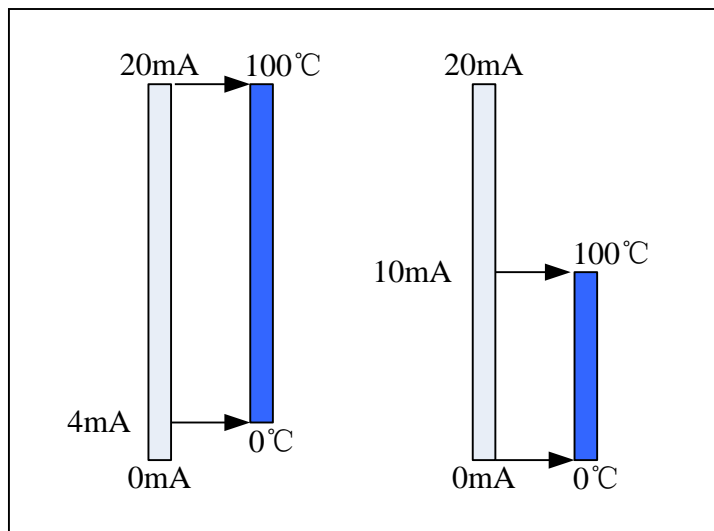
Channel types and signal types

Channel type	Signal type	Calculation type
current	0-20mA, 4-20mA, 0-10mA	linear calculation
voltage	0-5V, 1-5V, 20mV, 100mV	linear calculation
Resistance	400Ω	linear calculation
Frequency	Fr , Fr.	linear calculation
RTD	PT100, Cu50, Cu53, BA1, BA2	no
Thermocouple	S, R, B, K, N, E, J, T, WRE5-26, WRE3-25, F1, F2	no
Ordinary vacuum	0-20mA, 4-20mA, 0-5V, 1-5V,	normal vacuum calculation
Sub-vacuum	0-20mA, 4-20mA, 0-5V, 1-5V,	Sub-vacuum calculation

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

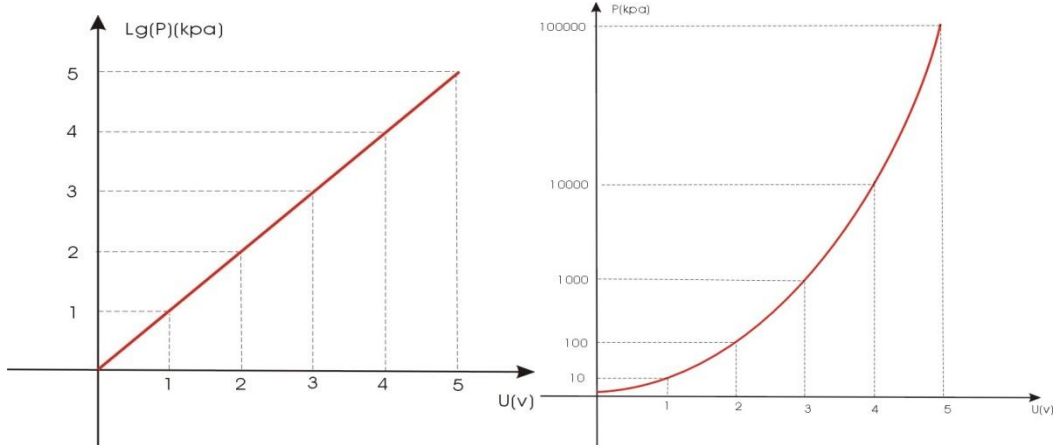
- Linear operation

Semaphores transforms to project quantity according to the signal range and practical range of linear



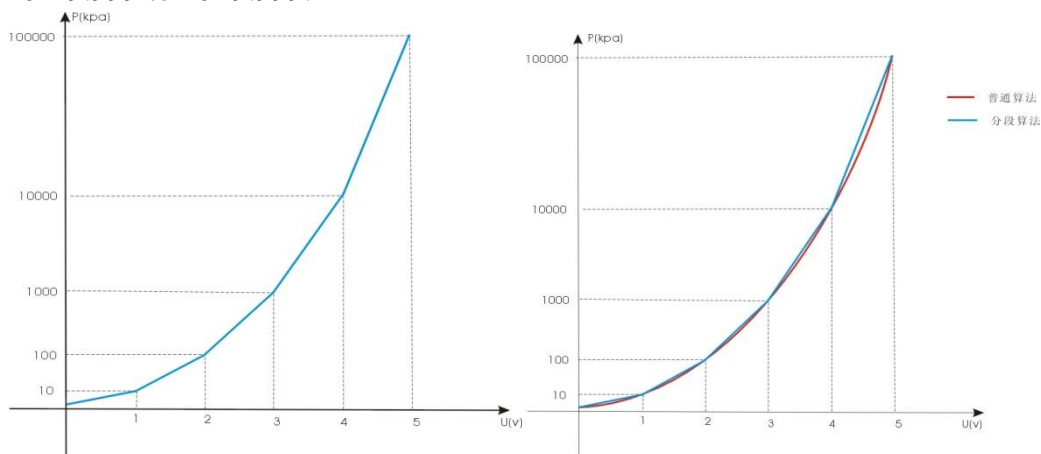
- Ordinary vacuum operation

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.



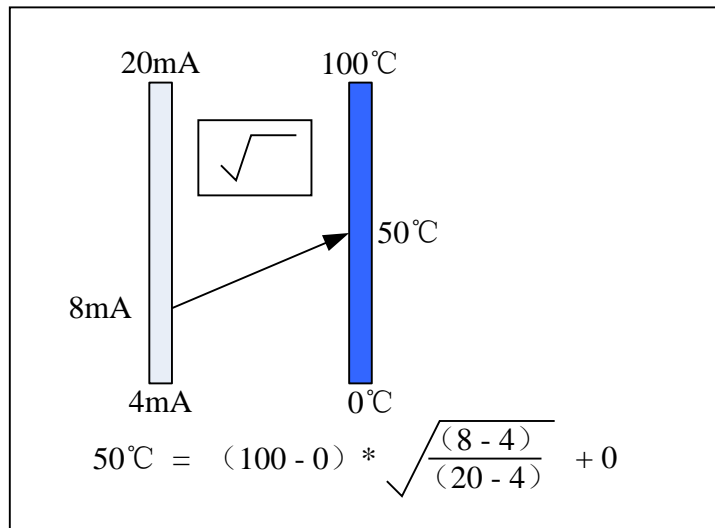
- Sub-vacuum operation

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



- Filtering operation

Filter parameters range from 0.0 seconds to 9.9 seconds .Take an example when the filter parameters is 1.0 seconds

Previous Collected Data	S0 = 10mA
Current Collected Data	S1 = 5mA
Filter Parameter f	1.0s
$\text{Result} = \frac{f * S0 + S1}{1 + f}$ $= 7.5\text{mA}$	

- Resection of the small-signal functions

Less than the set value of the semaphore is zero, range: 0.0% ~ 9.9%.

- Linear 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 and Measurement Range

Type	Measuring range
0-20mA	0mA ~ 20mA
4-20mA	4mA ~ 20mA
0-10mA	-10mA ~ 10mA
0-5V	0V ~ 5V
1-5V	1V ~ 5V
20mV	0mV ~ 20mV
100mV	0mV ~ 100mV
400Ω	0 ~ 400Ω
Fr	0 ~ 10KHz
Fr.	0.0~3000.0Hz
PT100	-200℃ ~ 650℃
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℃

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 is from 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”.

Input		2011-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %
		Copy01	Exit

1. Use the [left and right button] to move the cursor to the **【 Disable】**. 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 **【View 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”.

The screenshot shows a configuration window titled 'Input' with a timestamp '2011-4-12 11:59:09'. The window contains the following fields and controls:

Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %

At the bottom right, there are two buttons: 'Copy01' and 'Exit'.

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”.

Input		2011-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %
		Copy01	Exit

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= $k \times$ Quantities + b.

Operation:

Enter **【Input configuration screen】**, the method to enter please see “log configuration”.

Input		2011-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %
		Copy01	Exit

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”.

Input		2011-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %
		Copy01	Exit

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.

7.7 SET THE PARAMETERS OF CHANNEL FILTER

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

Operation:

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

Input		2011-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %
		Copy01	Exit

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 the section “set the channel type range”.

Operation:

Enter **【Input configuration screen】**, the method to enter please see “log configuration”.

Input		2011-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %
		Copy01	Exit

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”.

Input		2011-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel 01		
Unit	%		
Channel Type	Current		
Signal Type	4-20mA	Precision	2
Signal scale	4.00	20.00	
View scale	4.00	20.00	
Adjust(kx+b)	1.00	0.00	
Burnout	Min		
Filter	0.0 sec	Cut	0.0 %
		Copy01	Exit

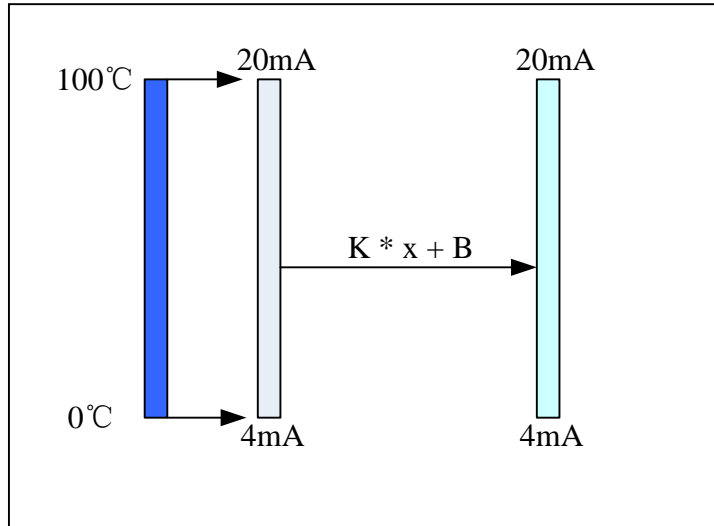
1. Use the [left and right button] to move the cursor to the **【Channel】**
2. Use the [up and down keys] to select the channel which needs configuration.
3. Use the [left and right button] to move the cursor to the **【Copy xx】**
4. Use the [up and down keys] to copy the source channel.
5. Use the [En] to 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 1-channel can perform transmission output.



8.1SET 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”.

	Channel	Adjust(kX+b)	
1	01	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 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 = $k \times$ original output current + b.

e.g

If the original channel scale is 0 ~ 100°C, and the current scale is 25°C, adjust

K=1.03, and b = 0.05, then

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

After adjusting, output = $K \times$ output + b = 1.03 * 8mA + 0.05 = 8.29 mA

Operation:

Enter **【Input configuration screen】**, the method to enter please see “log configuration”.

Output		2010-4-12 11:59:09	
	Channel	Adjust(kX+b)	
1	01	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.

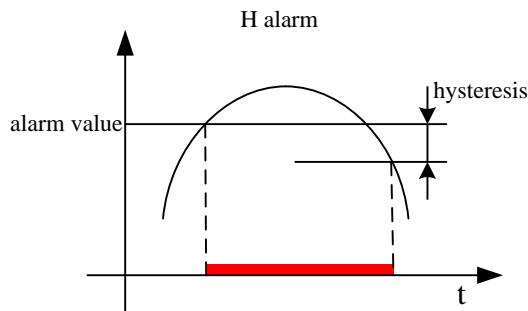
CHAPTER 9 SET ALARM CONFIGURATION

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.

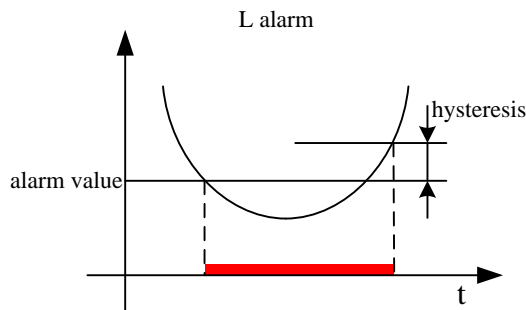
- **H Alarm:**

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.



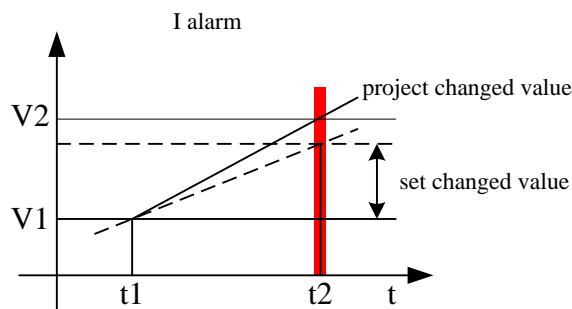
- **L Alarm:**

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.



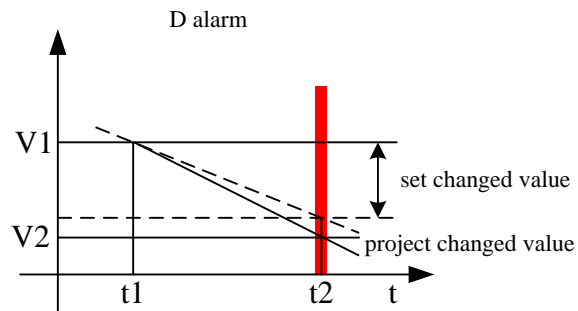
- **I alarm:**

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.



- **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 to 8, when multiple alarms use the same one relay output, and use the logic 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”.

The screenshot shows the 'Alarm' configuration screen with a blue header bar containing the title 'Alarm' and the timestamp '2011-4-13 11:33:58'. The main area is divided into two sections. The top section contains individual settings: 'Channel' (set to 1), 'Relay delay' (0 sec), 'Hysteresis' (0.00), 'I Alm Time' (1 sec), and 'D Alm Time' (1 sec). The bottom section is a table with four columns: 'Alarm', 'Type', 'Alarm Value', and 'Relay'. The table has four rows, with the first row (Alarm 1) having 'H' as the type and '16.00' as the value. The 'Relay' column for all rows shows 'R01', 'OFF', 'OFF', and 'OFF' respectively. A red box highlights the 'Type' and 'Alarm Value' columns for all rows. A red box highlights the 'Relay' column for the first row. A red box highlights the 'Exit' button at the bottom right. Red lines with numbers 1 through 5 point to these specific elements: 1 points to the Channel dropdown, 2 points to the Type dropdowns, 3 points to the Alarm Value text boxes, 4 points to the Relay dropdowns, and 5 points to the Exit button.

Alarm	Type	Alarm Value	Relay
1	H	16.00	R01
2	OFF	0.00	OFF
3	OFF	0.00	OFF
4	OFF	0.00	OFF

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; R01 ~ R02 stands for the corresponding relay output.
5. 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.

9.2 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”.

The screenshot shows the 'Alarm' configuration screen with a blue header bar containing the title 'Alarm' and the timestamp '2011-4-13 11:33:58'. The main area contains several settings: 'Channel' is set to '1', 'Relay delay' is set to '0 sec' (highlighted with a red box), 'Hysteresis' is '0.00', 'I Alm Time' is '1 sec', and 'D Alm Time' is '1 sec'. Below these are four rows of alarm configurations with columns for 'Alarm', 'Type', 'Alarm Value', and 'Relay'. The first row is active, showing '1', 'H', '16.00', and 'R01'. The other three rows are inactive, showing '2', '3', and '4' with 'Type' set to 'OFF' and 'Alarm Value' set to '0.00'. An 'Exit' button is located at the bottom right.

Alarm	Type	Alarm Value	Relay
1	H	16.00	R01
2	OFF	0.00	OFF
3	OFF	0.00	OFF
4	OFF	0.00	OFF

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”.

The screenshot shows the 'Alarm' configuration screen with a blue header bar containing the title 'Alarm' and the timestamp '2011-4-13 11:33:58'. Below the header, there are four rows of settings, each with a label and a dropdown menu:

- Channel: 1
- Relay delay: 0 sec
- I Alm Time: 1 sec
- D Alm Time: 1 sec

The 'Hysteresis' field is highlighted with a red box and contains the value '0.00'. Below these settings is a table with four columns: Alarm, Type, Alarm Value, and Relay.

Alarm	Type	Alarm Value	Relay
1	H	16.00	R01
2	OFF	0.00	OFF
3	OFF	0.00	OFF
4	OFF	0.00	OFF

An 'Exit' button is located at the bottom right of the screen.

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”.

Alarm 2011-4-13 11:33:58

Channel	1		
Relay delay	0 sec	Hysteresis	0.00
I Alm Time	1 sec	D Alm Time	1 sec

Alarm	Type	Alarm Value	Relay
1	H	16.00	R01
2	OFF	0.00	OFF
3	OFF	0.00	OFF
4	OFF	0.00	OFF

Exit

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 THE BACKGRIUND COLOR

This section describes how to set the background color of digital display screen and bar display screen.

Operation

Enter the **【Display configuration screen】**, for the methods to enter, please refer to the section 『login configuration』.

Group	Channel	Color
1	01	Red
2	02	Green
3	03	Blue
4	04	Orange

1. Use the [left and right button] to move the cursor to the **【Background color】**.
2. Use the [up and down keys] to select the direction, choose white or black.
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.

10.2 SET SCREEN BRIGHTNESS AND THE FIRST VIEW

This section describes how to set the screen brightness and the first screen after the startup of the instrument.

Operation

Enter the **【display configuration screen】**, for the methods to enter, please refer to the section 『login configuration』.

Display		2011-4-13 11:32:24	
BgColor	White	Brightness	10
Direction	Herizonta	First View	ViewAll
Group	Channel	Color	
1	01	Red	
2	02	Green	
3	03	Blue	
4	04	Orange	
Exit			

1. Use the [left and right button] to move the cursor to the **【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 to display after the instrument starts up.
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.

10.3 SET THE DIRECTION OF CURVES ON THE PAPER

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

Operation:

Enter **【Display configuration screen】**, the method to enter please see “log configuration”.

Group	Channel	Color
1	01	Red
2	02	Green
3	03	Blue
4	04	Orange

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.

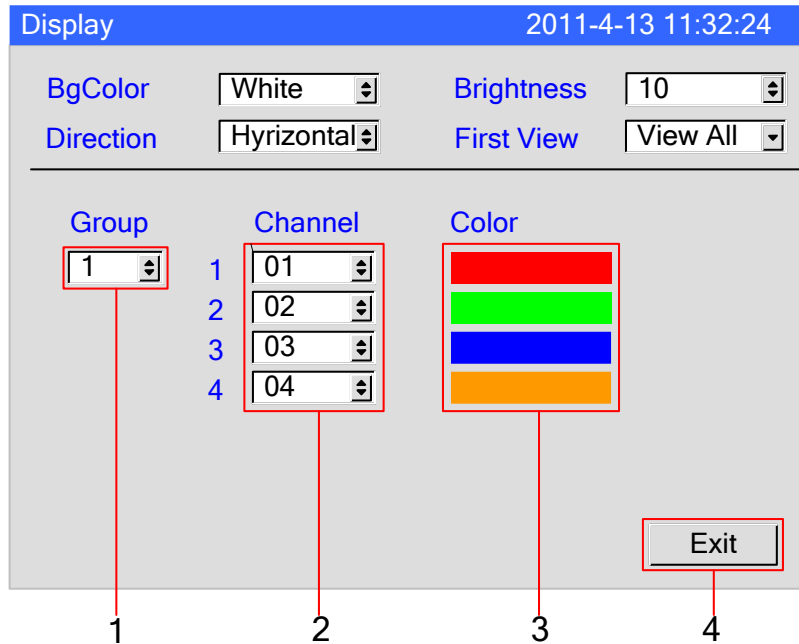
Select **【Cancel】** to continue setting parameters in [System] screen.

10.4 SET THE COMBINATION AND COLOR OF THE CHANNELS

This section describes the setting methods of combination of channels.

Operation:

Enter **【Display configuration screen】**, the method to enter please see “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 THE REPORT CONFIGURATION

11.1 SET THE CHANNEL ACCUMULATION, THE INITIAL VALUE, MULTIPLE, PRECISION AND SETTLE TIME

This section describes the setting method of accumulative channel and the concept of the accumulative initial value, accumulative multiple, purging accumulation and settle time.

Accumulative initial value: initial value of accumulation begins to accumulate.

Multiple: According to the multiple of the normal speed of accumulation to accumulate.

Purging accumulation: purge the accumulation of the current channel.

Precision: set the decimal digits of the accumulation value of all channels in the instrument reports.

Settle time: From the settlement time to the next settlement time point, it can be regarded as the accumulation per day since the startup of the accumulation function.

Operation:

Enter **【**report configuration screen, the method to enter please see “log configuration”.

The screenshot shows a software interface for report configuration. At the top, a blue header bar displays 'Report' on the left and the date and time '2011-4-13 11:32:24' on the right. Below the header, the interface is divided into several sections. The first section contains 'Precision' set to '2' and 'Settle Time' set to '00 hour'. The second section is a table for shift configurations:

Shift Num	Tag	From	To
3	1 A	00:30	08:30
2	B	08:30	16:30
3	C	16:30	00:30

The third section contains 'Channel' set to '01', 'Enable' set to 'ON', 'Initial' set to '0.00', and 'Multiple' set to '100.00'. At the bottom, there are two buttons: 'Clr Accu' and 'Exit'.

1. Use the [left and right button] to move the cursor to **【Precision】** , and use the [up and down keys] to adjust the scale, 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 the settlement time; range from 00 to 23 hour.

-
3. Use the [left and right button] to move the cursor to the **【Channel】** ., use the [up and down keys] to select channel.
 4. Use the [left and right button] to move the cursor to the **【Accumulation enable】** , use the [up and down keys] to turn on or turn off the cumulative function.
 5. Use the [left and right button] to move the cursor to the **【Initial】** , use the [up and down keys] 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 **【Multiple】** , use the [up and down keys] tune data, use the [En] to edit data, ranging from 0 to 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 THE NUMBER OF THE SHIFT REPORTS, TIME AND DISPLAY TAG

This section describes the number of shift reports and time and setting methods.
 The number of shift report: the number of shift reports per day, and the input range :
 2~5
 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 **【From】** , use the [up and down keys] to adjust the frequency of time.
3. Use the [left and right button] to move the cursor to the **【Tag】** , use the [Enter] button to edit the display tag of the shift report.
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

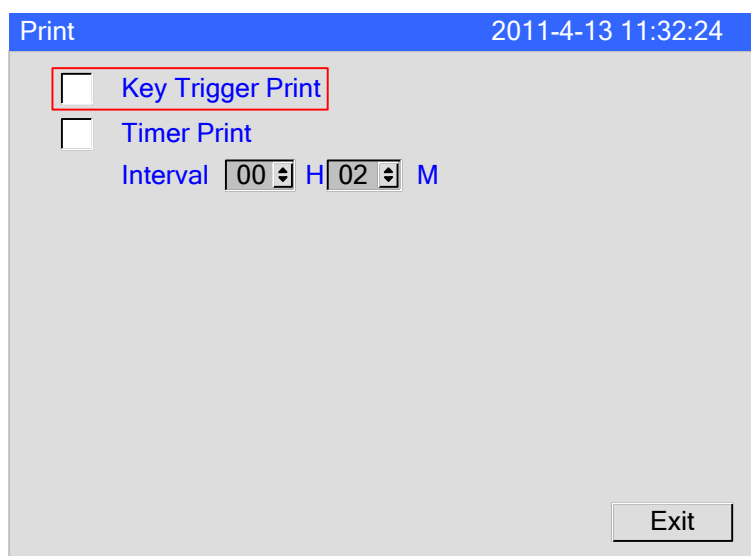
12.1 SET KEY TRIGGER PRINT

This section describes the key trigger printing functions and settings methods.

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.

Operation:

Enter **【print configuration screen】**, the method to enter please see “log configuration”.



1. Use the [left and right button] to move the cursor to the **【Key Trigger Print】**, use the [up and down keys] to open or close button printing functions.
2. 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.

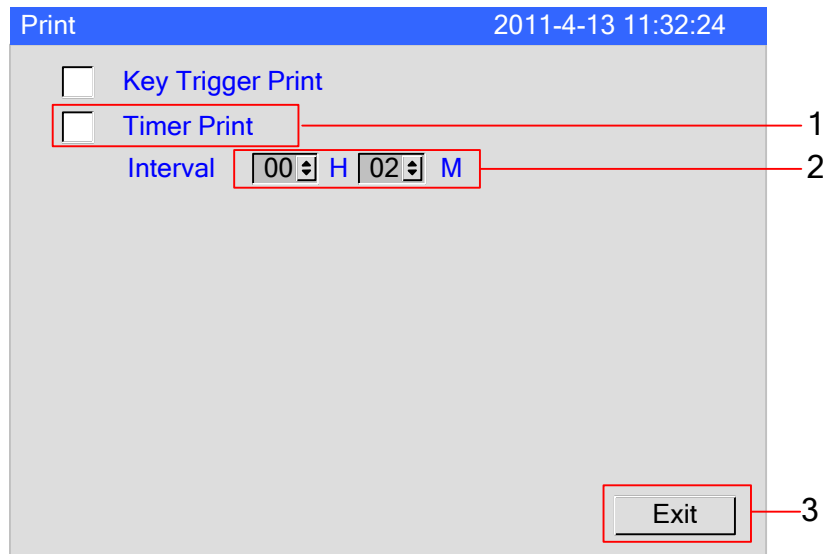
12.2 SET TIMER PRINTING AND THE TIME

This section describes the timer printing functions and settings methods.

Timer Print: each day, choose 0:00:00 as the starting time and print real-time data and accumulation according to time intervals.

Operation:

Enter **【print configuration screen】**, the method to enter please see “log configuration”.



1. Use the [left and right button] to move the cursor to the **【Timer Print】**, use the [up and down keys] to close to open timing printing functions.
2. Use the [left and right button] to move the cursor to the **【Interval】**, use the [up and down keys] to adjust the print interval time in the format X/hour, X/minute.
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 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”.

Comm		2011-4-16 13:50:41
Address	001	
Byteswap	1-2 3-4	
Baudrate	115200	
Parity	None	

Exit

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 1 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”.

The screenshot shows a configuration window titled 'Comm' with a timestamp '2011-4-16 13:50:41'. It contains four settings, each with a dropdown menu:

- Address: 001
- Byteswap: 1-2 3-4
- Baudrate: 115200 (highlighted with a red box)
- Parity: None

An 'Exit' button is located at the bottom right of the window.

1. Use the [left and right button] to move the cursor to the **【Baudrate】** .
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

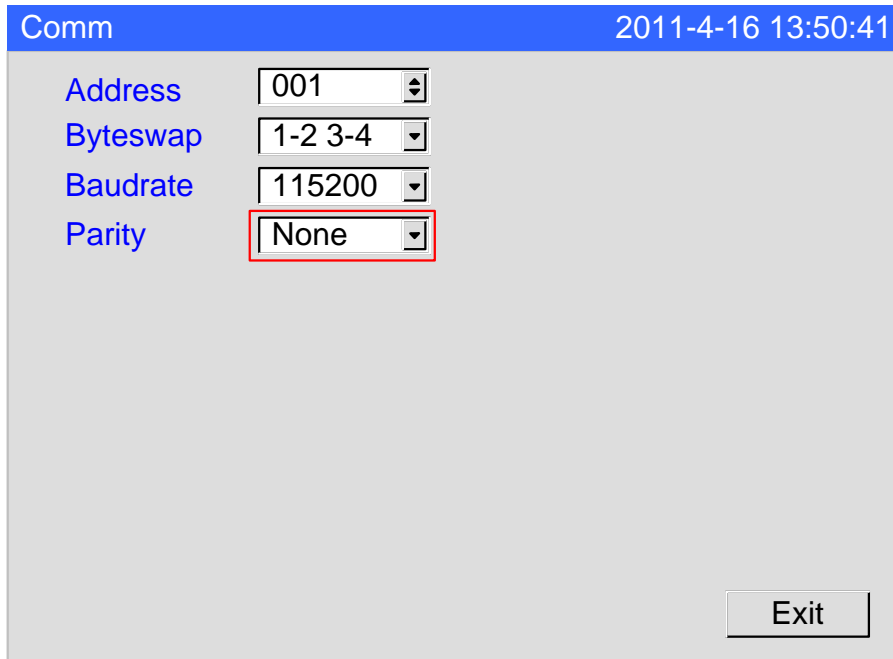
This section describes the setting method of serial communication check.

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”.



The screenshot shows a configuration window titled 'Comm' with a timestamp '2011-4-16 13:50:41'. It contains four dropdown menus: 'Address' (001), 'Byteswap' (1-2 3-4), 'Baudrate' (115200), and 'Parity' (None). The 'Parity' dropdown is highlighted with a red rectangular box. An 'Exit' button is located in the bottom right corner.

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”.

The screenshot shows a communication configuration screen with a blue header bar containing 'Comm' and the timestamp '2011-4-16 13:50:41'. Below the header, there are four configuration items, each with a dropdown menu: 'Address' (001), 'Byteswap' (1-2 3-4), 'Baudrate' (115200), and 'Parity' (None). The 'Byteswap' dropdown menu is highlighted with a red rectangular box. At the bottom right of the screen, there is an 'Exit' button.

1. Use the [left and right button] to move the cursor to the **【Byteswap】**.
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 Communication Instruction (04H Read Input Register)

Description

Read the meter input register, including real-time quantity, cumulative quantity and other data.

Corresponding to 32-bit data (cumulative and floating-point engineering quantities), it supports byte swapping and provides four exchange sequences to choose from: 1-2 3-4, 2-1 4-3, 3-4 1- 2, 4-3 2-1, the default is 2-1 4-3.

Broadcast commands are not supported.

Send

The following is an example of reading a register that acquires address 30201-30202 in a 2-1 4-3 exchange order from a device with address 1.

Sending format

Name	Data (Hex)
Slave address	0x 01
Function code	0x 04
High starting address	0x 00
Low starting address	0x C8
High number of registers	0x 00
Low number of registers	0x 02
Low CRC check	0x F0
High CRC check	0x 35

Note: Register 30201 address $30201 - 30001 = 200 = 0x00C8$

Return

The following is the normal return of the send command on the previous page.

Return format

Name	Data (Hex)
Slave address	0x 01
Function code	0x 04
Number of bytes	0x 04
Register 30009 high byte(2 nd)	0x 96
Register 30009 low byte(1 st)	0x 80
Register 30010 high byte(4 th)	0x 00
Register 30010 low byte(3 rd)	0x 98
Low CRC check	0x D6
High CRC check	0x 4E

Note:

The 4th byte is the most, the 1st byte is the last.

value = 0x 00 98 96 80 = 10000000

13.6 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

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

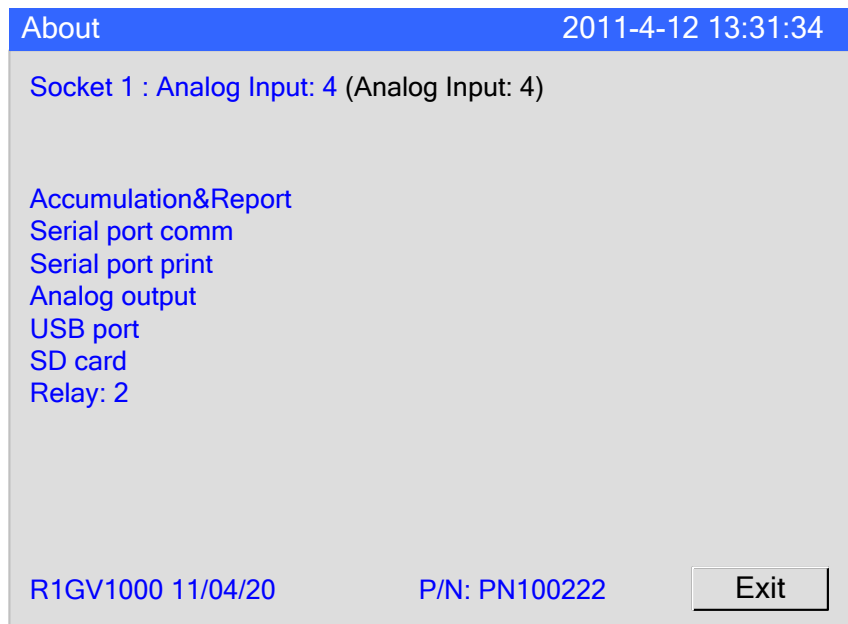
CHAPTER 14 CHECK SYSTEM INFORMATION

14.1 CHECK SYSTEM INFORMATION

This section describes how to check system information, and instrument setting.

Operation:

Enter **【System configuration screen】**, the method to enter please see “log configuration”.

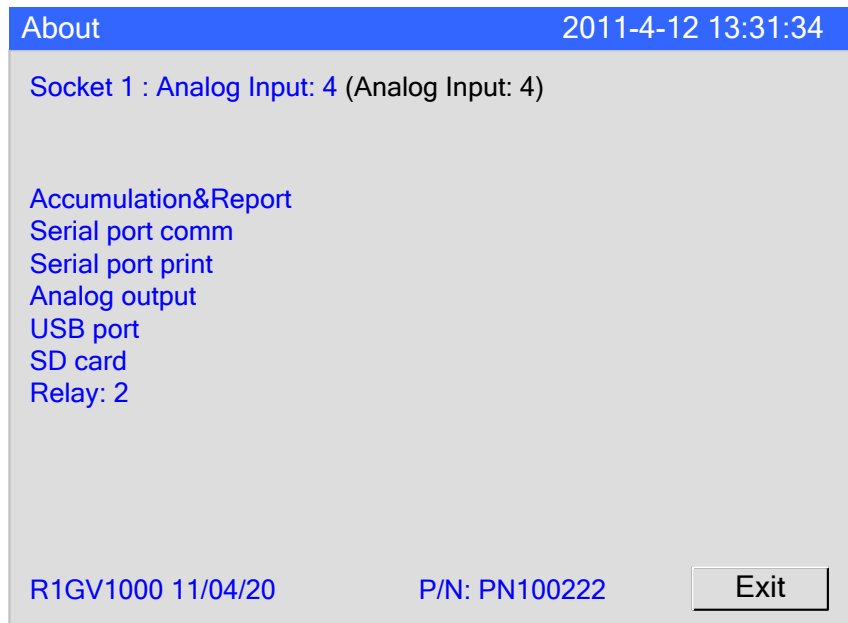


14.2 CHECK AD BOARD

This section describes the methods to check the status of AD board.

Operation:

Enter **【System configuration screen】**, the method to enter please see “log configuration”.



Blue Text (1: R7A8C: 4) is the inherent information in AD, black text (R7A8C: 4) 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.

CHAPTER 15 EXPORT AND IMPORT THE CONFIGURATION FILE

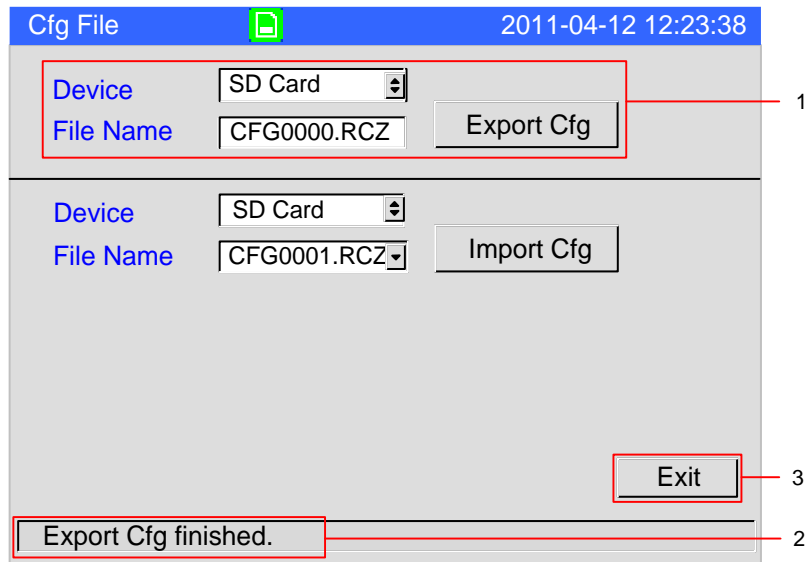
15.1 EXPORT CONFIGURATION FILE

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

For the configuration file export, it can export the current instrument setup information, including input configuration, recording configuration, alarm configuration, and save to external storage media in the root directory.

Operation

Enter **【System configuration screen】** , for the method to enter , please refer to the section 『Login configuration 』 .



1. Use the [left and right button] to move the cursor to the **【Device】** , and 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] to modify the file name; use the [left and right button] to move the cursor to the **【Export configuration】** , use the [Enter] to export configuration.
2. Show the configuration file export situation.
3. Use the [left and right button] to move the cursor to the **【Exit】** , use [Enter] to exit the configuration file screen

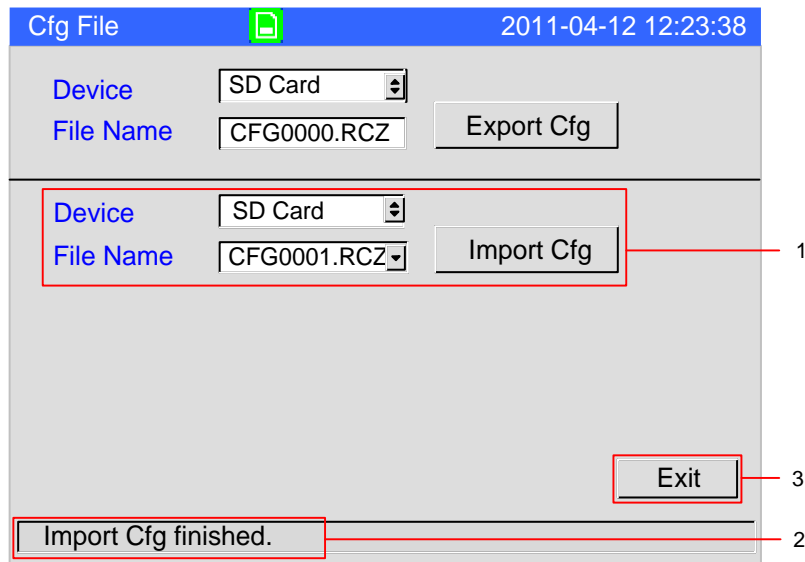
15.2 IMPORT CONFIGURATION FILE

This section describes the meaning of configuration file import and methods of operation.

Import the configuration file: if it needs to set multiple instrument with the same type and the same configuration, it can only configure one of the instrument to export the configuration file in this instrument. For the configuration file export, please refer to the section 『configuration file export』, and the remaining instruments only need to import the configuration file, which simplifies multi-channel configuration operation.

Operation

Enter 【System configuration screen】, for the method to enter, please refer to the section 『Login configuration』.



1. Use the [left and right button] to move the cursor to the 【Device】, and 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 import file name; use the [left and right button] to move the cursor to the 【Import configuration】, use the [Enter] to import configuration.
2. Show the configuration file import situation.
3. Use the [left and right button] to move the cursor to the 【Exit】, use [Enter] to exit the configuration file screen

CHAPTER 16 SPECIFICATIONS

16.1 SIGNAL INPUT AND ALARM

Measurement input

Item	Specification
The number of input channels	simultaneously measuring up to 16 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	0mA ~ 20.00mA
	0-10mA	0mA ~ 10.00mA
Voltage	1-5V	1.000V ~ 5.000V
	0-5V	0V ~ 5.000V
	20mV	0mV ~ 20.00mV
	100mV	0mV ~ 100.00mV
Resistance	400Ω	0.0Ω ~ 400.0Ω
Digital signal	FR	0Hz ~ 10000Hz
	FR.	0.0Hz ~ 3000.0Hz
RTD	PT100	-200.0°C ~ 650.0°C
	Cu50	-50.0°C ~ 140.0°C
	Cu53	-50.0°C ~ 150.0°C
	BA1	-100°C ~ 600°C
	BA2	-100°C ~ 600°C
Thermocouple	S	-50°C ~ 1768°C
	R	-50°C ~ 1768°C
	B	250°C ~ 1820°C
	K	-50°C ~ 1300°C
	N	-200°C ~ 1300°C
	E	-100°C ~ 1000°C
	J	-100°C ~ 1000°C
	T	-200°C ~ 400°C

	WRE5-26	0°C ~ 2310°C
	WRE3-25	0°C ~ 2315°C
	F1	600°C ~ 2000°C
	F2	600°C ~ 2000°C

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 1uA

Item	Specification
Thermocouple cold junction compensation	Using internal cold junction compensation, the compensation accuracy :± 1 °C
Digital filter	0 ~ 9.9 seconds inertia filter
Vacuum calculation	
General calculation	LOG curve is used in the whole range
Sub-calculation	Linear calculation 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 Internal relay number: 2 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

16.2 DISPLAY FUNCTION

Display

Item	Specifications
Display *	3.5-inch TFT color LCD display (320 × 240 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	4
	The number of channels which can be allocated to each group ≤ 4
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 × 30 div
Scale	To display each channel (0% ~ 100%)
Digital Display Update Rate	Display measured values with digital 1 second
Bar graph display Update Rate	display measurement on the bar graph 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 7letters (numbers)
Status display section	Show the status of this instrument in the upper part of the display screen
Display content	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

16.3 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 4GB(U disk), 2 GB (SD card)
File format	FAT32
File Name	The default format is : DAT+ "number" (can edit)
Report Name	REP+ "number"(can edit) The default format is: CSV Shift report , RPTS + "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	Interval recording

16.4 OTHER STANDARD FEATURES

Time-related functions

Item	Specifications
Clock	Can operate in 2000 ~ 2099
Clock Accuracy	$\pm 10\text{ppm}$ (0 ~ 50 °C), 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)

16.5 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: 2
Relay electric shock rating	250VAC(50/60Hz)/3A, 250VDC/3A((load resistance))
Output Type	Normal open
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

24VDC Power Distribution

Item	Specifications
Loop	1
Output voltage	22VDC ~ 25VDC (rated output current)
Maximum output current	30mADC(overload protection current: approximately 90mADC)
Allowed impedance	$\leq 750\Omega$

USB Function

Item	Specifications
USB port	Compatible with USB2.0 protocol
Number of ports	1
Capacity	Maximum: 4 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: 4 GB
Devices can be connected	SD card

Analog signal output

Item	Specifications
Output Type	4-20mA
Number of output channels	Up to 4
Allowed impedance	$\leq 750\Omega$

16.6 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	1 ~ 10mm
Material	Panels and Terminal Material: ABS plastic Shell: ABS plastic
External dimensions	100(W)×100(H)×110(D)(D: the length from the installation panel to terminal)
Weight	About 0.5 Kg(not including accessories)

Standard operating conditions

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

Power

Item	Specifications
Rated supply voltage	220VAC
Allowed voltage range	85VAC ~ 220VAC
Rated frequency range	47-63Hz
Power consumption	≤10W(including the matching function)

Insulation

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

Transportation and storage conditions

Item	Specifications
Ambient temperature	$-10^{\circ}\text{C} \sim 60^{\circ}\text{C}$
Environment Humidity	0% \sim 95%(non-condensing)
Anti-Vibration	10 to 55HZ, $10\text{m}/\text{S}^2$, two hours
Anti-shock	Working time $30/\text{S}^2(3\text{g})$, transit time 100g

Electrical characteristic

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

Frequency input

Item	Specification
Low level	Minimum:-5V, Maximum:2V
High level	Minimum:4V, Maximum:26V
Duty ratio	10%-90%
Drive current	Minimum:1.5mA

Analog output

Item	Specification
Output signal	4—20mA
Resolution ratio	12 bit
Load	750ohm
Precision	0.2%F.S
Response time	1second
Temperature drift coefficient	1uA/°C

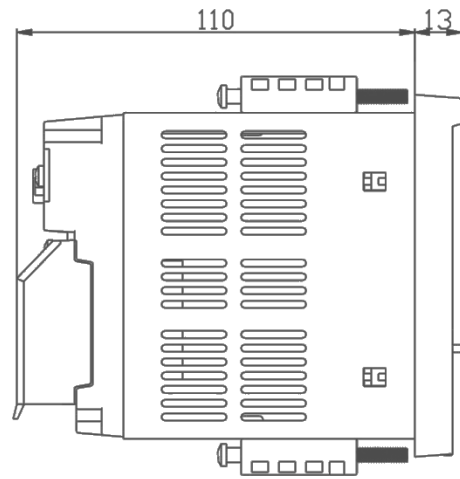
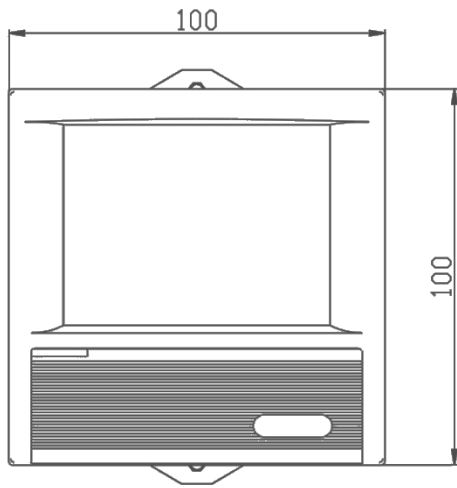
Other standard

Item	Specification
Data storage limit	About 10 year
Safety 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

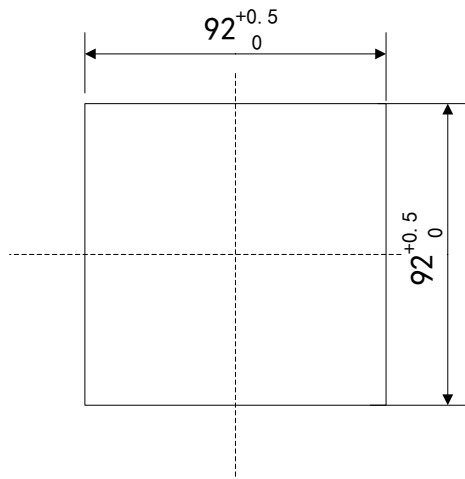
16.7 EXTERNAL DIMENSIONS

KT100S

Unit: mm

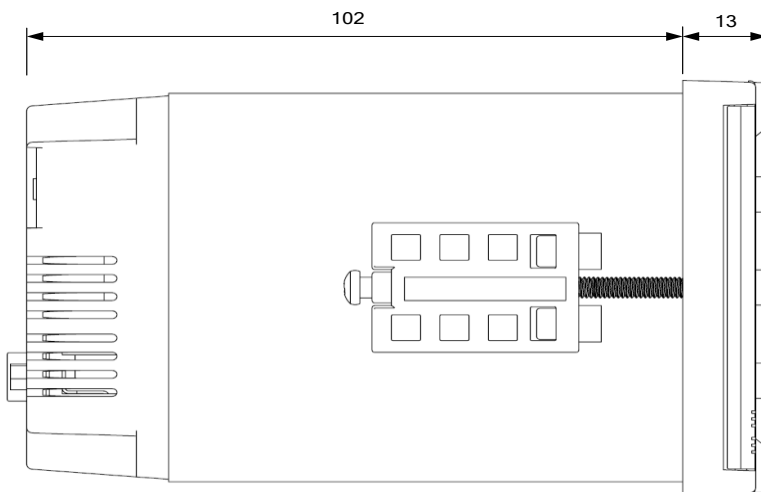
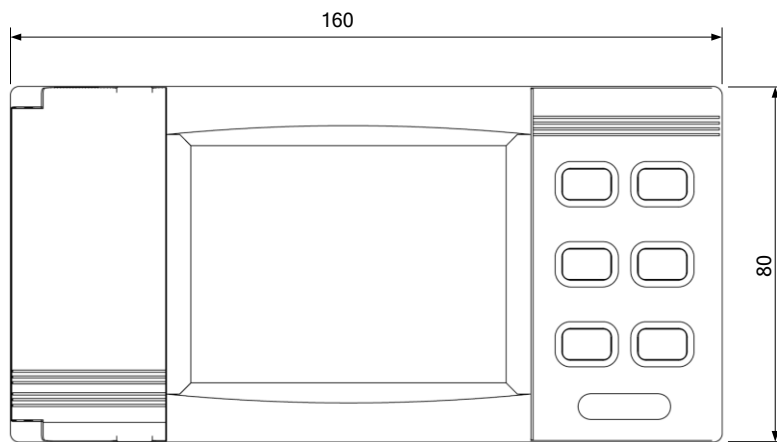


Hole size



KT100H

Unit: mm



Hole size

