

---

**User's  
Manual**

# **User's Manual**

---

---

IMR5-EZ04



**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**

Fourth Edition,	January 2022,	IMR5-EZ04e
Second Edition,	January 2011,	IM01C52R01-01E_r2[OE]
First Edition,	July 2009,	IM01C52R01-01E_r1[OE]

## Safety Precautions

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

### **WARNING**

- **Power Supply**

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

- **Protective Grounding**

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

- **Necessity of Protective Grounding**

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

- **Defect-Free Protection**

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

- **Do Not Operate in Explosive Atmosphere**

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

- **Do Not Remove Covers**

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

- **External Connection**

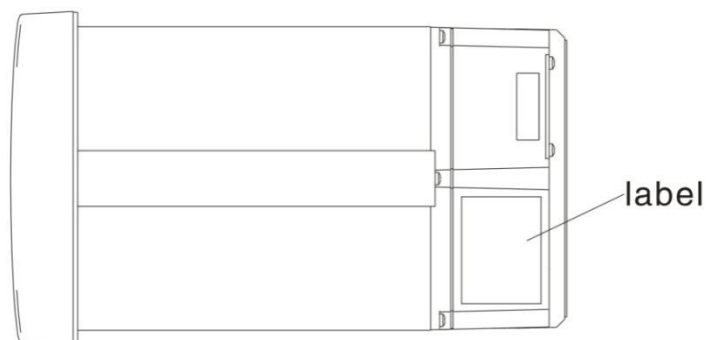
Connect the protective grounding before connecting to the items under measurement or external control circuit connections.

- **Damage to the protection**

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

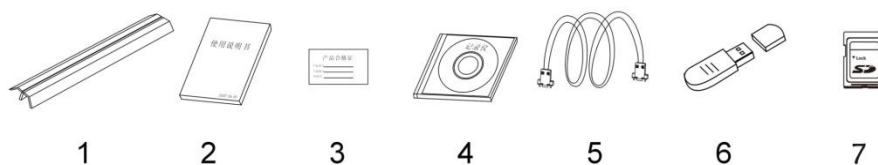
## Checking the Contents of the Package

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



## Accessories

The following accessories are supplied with the instrument. Make sure that all items are present and undamaged.



Number	Name	Qty	Notes
1	Mounting bracket	2	For panel mounting
2	User's Manual	1	Order
3	Certification	1	Manufacture Date
4	Software	1	Order
5	Communication Cord	1	1.5m(Included only when the Communication interface is RS232.)
6	U Disk	1	Included only when the external storage is ordered. Capacity and model of the USB storage may vary, max:32GB.
7	SD card	1	Included only when the SD card storage is ordered. Capacity and model of the storage may vary, max:32GB.

### Accessories (Sold Separately)

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

Number	Name	Quantity	Notes
1	U Disk	1	Capacity and model of the storage may vary, max:32GB.
2	SD Card	1	Capacity and model of the storage may vary, max:32GB.

### Symbols Used in this Manual

Unit

K	Denotes"1024"
k	Denotes"1000"
M	Denotes"1024K"
G	Denotes"1024M"
B	"Bytes"

### Symbols (The following symbols are used in this manual)

**WARNING:** precautions that should be observed to prevent injury or death to the user.

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

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

### Operation of Marks

The following symbols are used during the explanation of operation

[ ] : represents key's name. Example: [Page] [En]

『 』 : represents a reference item. Example: 『 Input Channel 』

【 】 : indicates screen element .Example: 【 Device Name 】

## Contents

<b>Chapter 1</b>	<b>Overview of the Functions</b>	<b>1</b>
1.1	Overview of the Instrument	1
1.2	Functions of the Input Section	2
1.3	Display Function	4
1.4	Storage Function	6
1.5	Alarm Function	7
1.6	Report Functions (Option)	7
1.7	Output Functions (Option)	8
1.8	Communication Functions (Option)	8
1.9	Other Functions	8
<b>Chapter 2</b>	<b>Before Using the Instrument</b>	<b>9</b>
2.1	Precautions ON the use of the Instrument	9
2.2	Installing the Instrument	10
2.3	Input and Output Signal Wiring	12
2.4	Alarm Output Wiring (Option)	15
2.5	Connect Power Supply	17
2.6	Connect External Switching Line for File Storage	19
2.7	24VDC Transmitter Power Wiring (Option)	20
2.8	RS232C/RS485 Communication Wiring	22
2.9	Connect Ethernet (Option)	24
<b>Chapter 3</b>	<b>Names of Parts/Common Operations</b>	<b>25</b>
3.1	Names of Parts and Functions	25
3.2	Inserting/Removing the External Storage Medium	27
3.3	Run Mode	28
3.4	Configuring the Functions	29
3.5	Common Key Operations	30
<b>Chapter 4</b>	<b>Display Screens and its Function</b>	<b>34</b>
4.1	Switching Operation Screen	34
4.2	Status display section	35
4.3	Digital Display Screen	36
4.4	Bar Graph Display	38
4.5	Real-Time Trend Screen	40
4.6	History Trend Screen	42
4.7	Function Screen	45
4.8	File List	46
4.9	Storage Operation	47
4.10	Data Backup	48
4.11	Data Printing	50
4.12	Alarm Summary	51
4.13	Accumulative Report	52
4.14	Power-Down Record	56
4.15	System Log	57
4.16	Log Configuration	58
<b>Chapter 5</b>	<b>System Configurations and its Function</b>	<b>59</b>
5.1	Set the Device Name\Date\Language\Password\RJC	59
5.2	Implementation of the Factory Settings	60
5.3	Implementation of Purging Data	63
<b>Chapter 6</b>	<b>Set Records of the Configuration</b>	<b>64</b>
6.1	Set the Mode\Type\Interval of Recording and Automatic Backup	64

6.2	<i>Set the Trigger Condition</i> .....	66
6.3	<i>Purge Historical Records</i> .....	67
<b>Chapter 7</b>	<b>Set the Input Configurations</b> .....	<b>68</b>
7.1	<i>Set Parameters for the Input Channel</i> .....	73
7.2	<i>Copy Channel Configuration</i> .....	74
<b>Chapter 8</b>	<b>Set Output Configurations</b> .....	<b>75</b>
8.1	<i>Set the Output Channel</i> .....	76
<b>Chapter 9</b>	<b>Set Alarm Configurations</b> .....	<b>77</b>
9.1	<i>Set the Alarm and Relay Contract</i> .....	79
9.2	<i>Set The Delay\ Hysteresis\ Change Alarm Time</i> .....	80
<b>Chapter 10</b>	<b>Set the Display Configurations</b> .....	<b>81</b>
10.1	<i>Set the Screen Brightness and the First Screen</i> .....	81
10.2	<i>Set the Combination and Color of the Channels</i> .....	82
<b>Chapter 11</b>	<b>Set the Report Configurations</b> .....	<b>83</b>
11.1	<i>Set the Channel Accumulation, the Initial Value and Magnification</i> .....	83
11.2	<i>Set the Number of the Shift Reports, Time and Display Tag</i> .....	85
<b>Chapter 12</b>	<b>Set Printing Configuration</b> .....	<b>86</b>
12.1	<i>Set Printing Configuration</i> .....	86
<b>Chapter 13</b>	<b>Set Communications Configuration</b> .....	<b>87</b>
13.1	<i>Set Device Address and the Order of Byte-Swapping</i> .....	87
13.2	<i>Set Communication Baud Rate and Check</i> .....	88
13.3	<i>Modbus-RTU protocol</i> .....	89
13.4	<i>Set Ethernet Configuration</i> .....	90
13.5	<i>Modbus/TCP protocol</i> .....	91
13.6	<i>Register address</i> .....	92
<b>Chapter 14</b>	<b>System Information and Upgrade</b> .....	<b>93</b>
14.1	<i>Check System Information</i> .....	93
14.2	<i>Upgrade</i> .....	94
<b>Chapter 15</b>	<b>Import and Export Configuration File</b> .....	<b>95</b>
15.1	<i>Export Configuration File</i> .....	95
15.2	<i>Import Configuration File</i> .....	96
<b>Chapter 16</b>	<b>Specifications</b> .....	<b>97</b>
16.1	<i>Signal Input and Alarm</i> .....	97
16.2	<i>Display Function</i> .....	99
16.3	<i>Data Storage Function</i> .....	100
16.4	<i>Other Standard Features</i> .....	101
16.5	<i>Choose Accessories</i> .....	101
16.6	<i>General Specifications</i> .....	103
16.7	<i>External Dimensions</i> .....	106

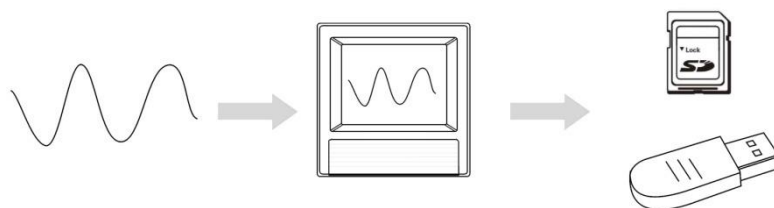


## Chapter 1 Overview of the Functions

### 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 1~16.

The scan interval of measurement is 1 second.

### Input Type and Computation

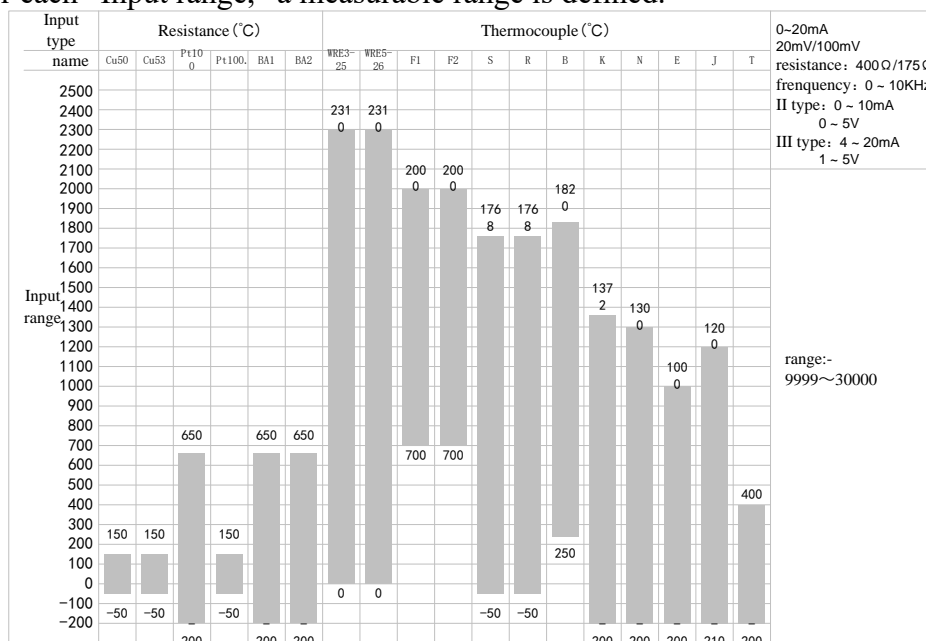
You can select the input type of a measurement channel as follows. You can also perform computation for instance, the “square root,” on the measured data. For the procedure related to setting the different modes, see section 『System Configurations』

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

### Input Range and Measurable Range

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

For each “Input range,” a measurable range is defined.



**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”.

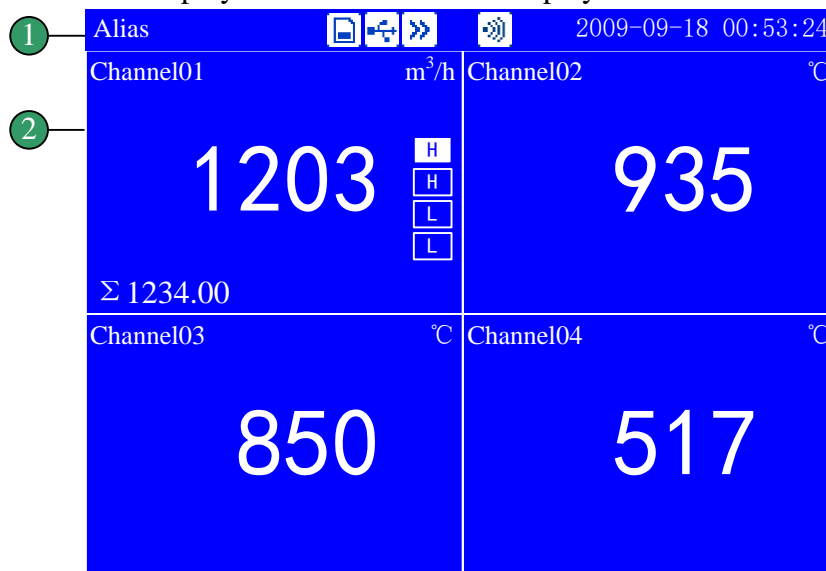
**Filter**

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 5.6" 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 6 channels can be assigned to a single group. For the procedure used to assign channels to groups, see section 『Configuration display』.

Up to 6 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, max: 32GB (optional);

Normal SD card, max: 32GB (optional), non SDHC card.

### Measurement period and recording intervals

AD sampling period is 120 milliseconds, which is an integer multiple of 50Hz power period. This can effectively eliminate the interference of power frequency. The measurement interval of signal is fixed at 1s. The measuring and computing are completed in every scan interval. Display data is generated by these data.

Recording Interval is used by the instrument to record the time interval of data which is saved to the internal memory.

### Saving Data to Internal Memory

The display data are saved to internal memory continuously according to the recording interval.

If the instrument is unplugged, the data that is lost while unplugged will be complemented by '0' 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 to reaching the trigger conditions set by the user, the instrument will also automatically back up historical data to the SD card. For the trigger condition and operating setting, please refer to the 『recording Configuration settings』 section.

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 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	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 (Option)

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

### Accumulation Computation

The accumulation computation is performed every second.

The accumulation computation can be performed on each measurement channel.

For detail, see section 『Report Setting』

### Report function

Based on total accumulated data to show generated shift reports, hourly reports, daily and monthly reports and to keep the data up to 410 days.

Class report: According to the number of class and time settings to show the cumulative amount of each shift.

Hourly report: Show the cumulative amount generated per hour.

Daily report: Shows the cumulative amount generated every day.

Monthly report: Shows the cumulative amount generated per month.

## 1.7 Output Functions (Option)

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 4 channels transmitter output.

The maximum load of each channel is 750Ω.

For detail, see section 『 Output Configuration Setting 』

## 1.8 Communication Functions (Option)

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

### 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 hardware Configuration software.

### Ethernet

RJ45 can be selected when the instrument communicates with PC.

By using the Modbus/TCP protocol.

### Connect to the panel printer

The instrument can be connected to the panel printer.

You can print history data and history curve manually.

Print real-time data can be automatic or manual.

## 1.9 Other Functions

### 24 VDC Power Supply for Transmitter (Option)

The instrument provides 4 channels power supply of 24 VDC. The maximum current of each channel can be provided is 60mA.

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



## **Chapter 2 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
<p>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.</p> <p>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 do not do it.</p>

### 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 (25.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 5.6" 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.

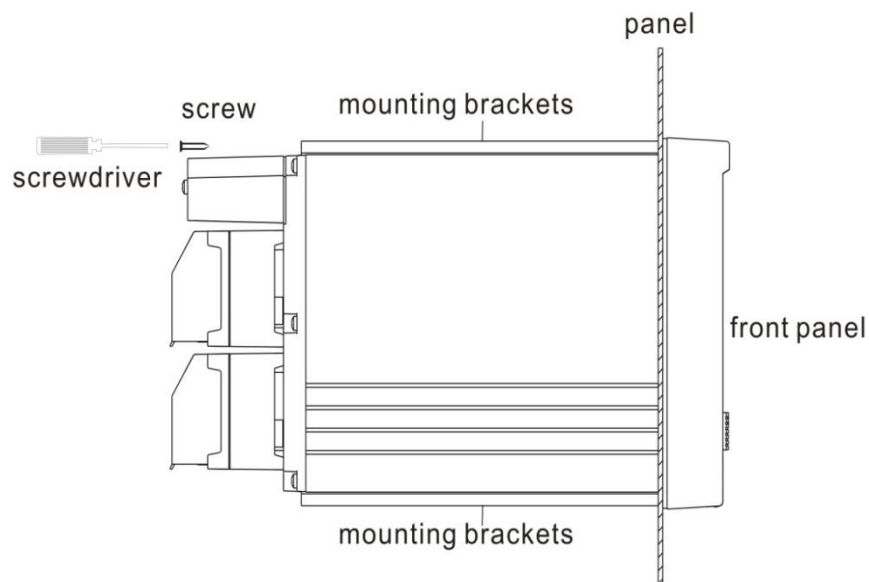
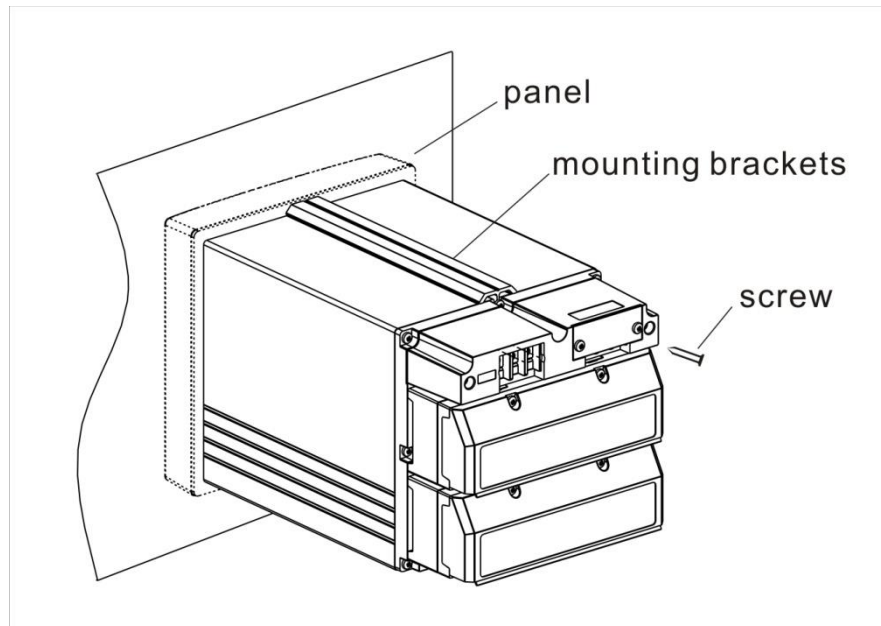
## Installation Procedure

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  $0.5\text{mm}^2$  or less recommended).

- Make sure that the ambient temperature remains reasonably stable. Large temperature fluctuations can occur if a nearby fan turns ON or OFF.

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

If you need to make a parallel connection, then

- Ground the instruments to the same point.

- Do not turn ON or OFF another instrument during operation. This can have adverse effects on the other instruments.

- RTD cannot be wired in parallel.

- Current signal cannot be wired in parallel.

**WARNING**

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

**CAUTION**

Do not apply input signals that exceed the following values. This can damage the instrument.

Maximum input voltage

Voltage range of 0.2 VDC or less or thermocouples:  $-1V \sim +5V$

Voltage range between 2 and 10 VDC:  $-1V \sim +12V$

Current:  $-4mA \sim +25mA$

Maximum common mode noise voltage

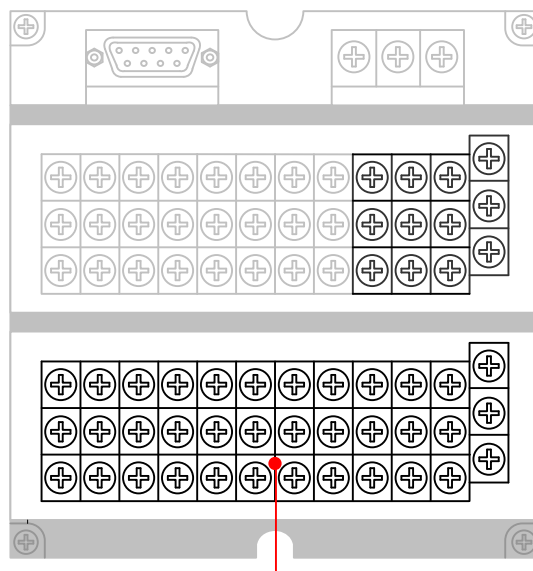
250VACrms(50Hz)

**Wiring Procedure**

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

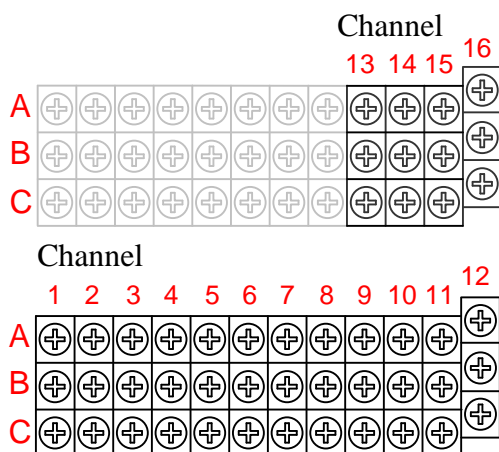
**Note**

Remove the rear terminal cover in order to easily carry out wiring work.  
To prevent bad connection, after wiring please carefully tighten the screws.

**The position of input / output signal terminal in the tail terminal**

Input /Output signal terminal

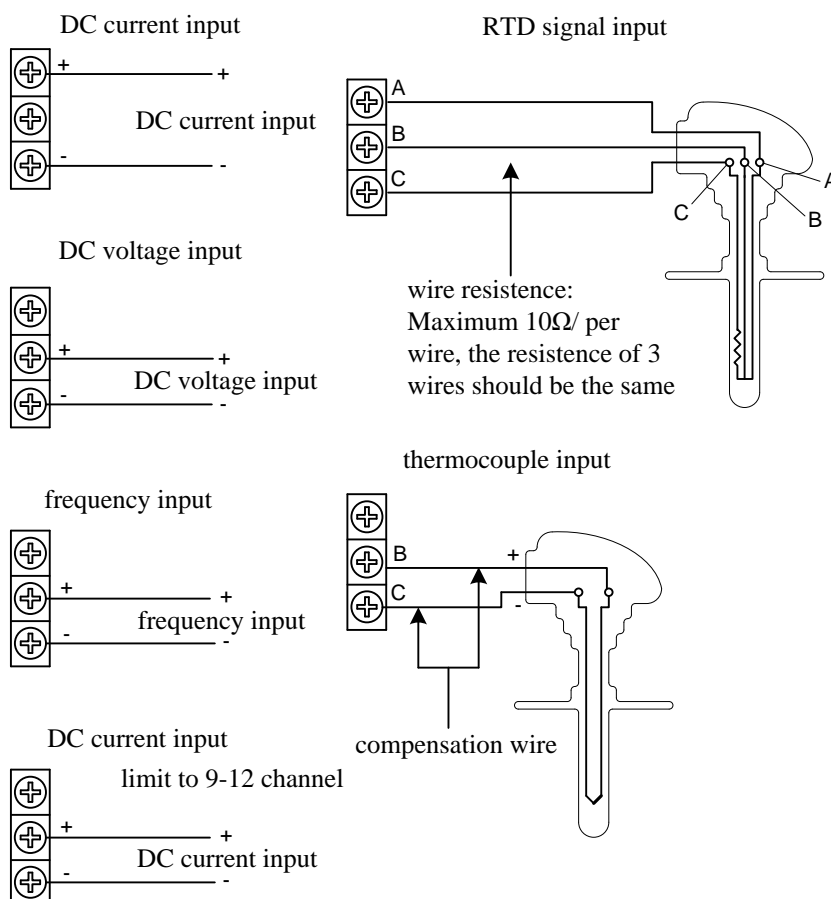
## Input / output signal channel arrangement



Note:

If the channel number is less than 12, the signal terminal from 13 to 16 channels will be used in relay output and input digital signal.

## Wiring diagram



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

## 2.4 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.

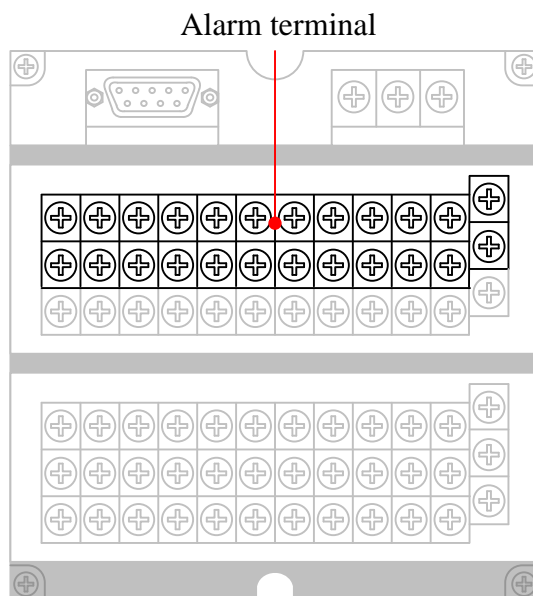
### Wiring Procedure

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

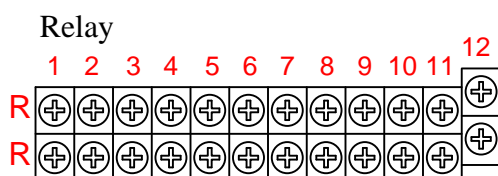
### CAUTION

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

### Alarm Output Terminal Position

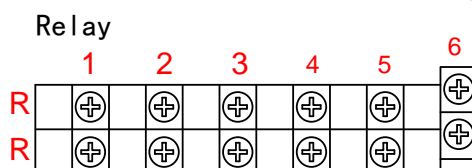


## Normally open alarm relay contact arrangement



Note: If the channel number is more than 12, then the largest contact number is 8, and contact terminal from 9 to 12 is used as signal input terminal in channel 13 to 16.

## Normally closed alarm relay contact arrangement

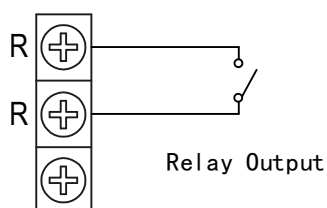


## Relay Specifications

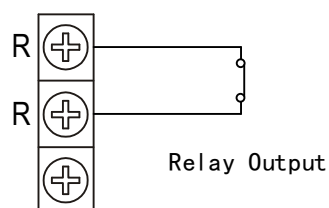
Item	Content
Output	Relay transfer contact ( switchable)
Output capacity	250VAC/3A 30VDC/3A
Dielectric	500VAC/one minute

## Wiring diagram

Normally open alarm relay



Normally closed alarm relay





## 2.5 Connect Power Supply

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

Precautions to be taken when wiring the power supply

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

### WARNING

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

To prevent fire, use doubled-insulated wire

Make sure to earth ground the protective earth terminal through a grounding resistance less than  $10\Omega$  before turning ON the power.

Use crimp-on lugs (designed for 4mm screws) for power and ground wiring termination.

Make sure to provide a power switch (double-pole type) on the power supply line in order to separate the instrument from the main power supply. Put an indication on this switch as the breaker on the power supply line for the instrument.

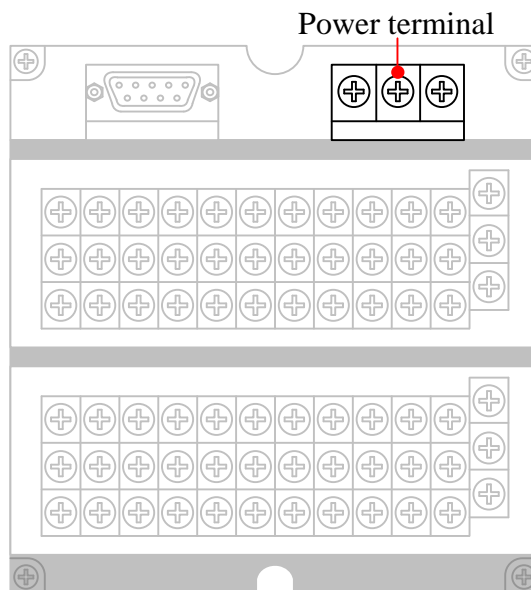
Switch Specification Rated current: 3A or more

Connect a fuse (between 2A and 15A) to the power line.

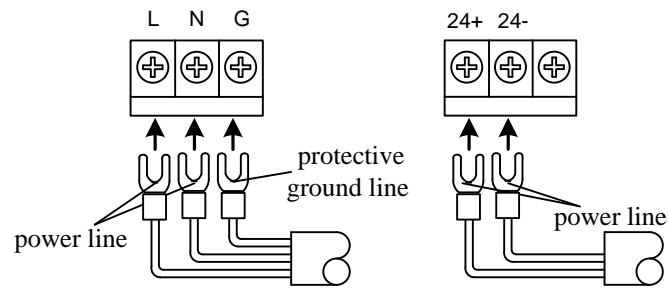
### Wiring Procedure

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

The position of power terminal in the rear terminal



## Terminal Arrangement



## Relay Specifications

Item	Alternating Current Supply
Input Voltage	85VAC ~ 265VAC
Input Frequency	50Hz

## 2.6 Connect External Switching Line for File Storage

This section describes how to connect the external switching line for file storage. First, the trigger condition of the instrument selects switch, for the trigger condition, please refer to 『recording Configuration settings 』 section. Be sure to read this section before connecting the digital input signal line.

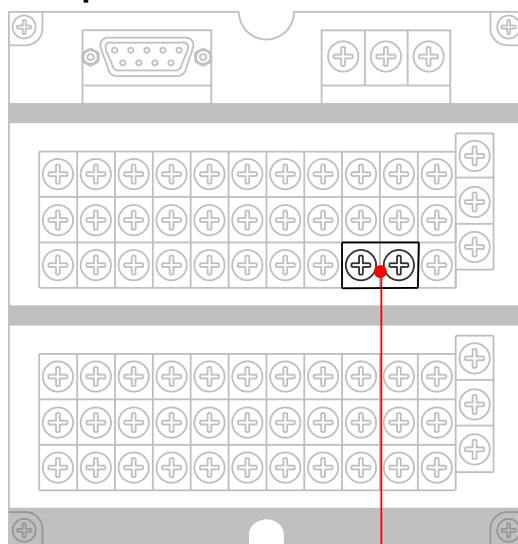
### Connection type

1. After disconnecting the instrument's power, remove the rear terminal cover.
2. Connect digital input signal lines and digital input terminal line.
3. Fit with rear terminal cover, and power on.

### Note

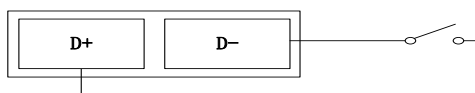
Remove the rear terminal cover to carry out wiring work easily. In order to prevent poor contact, carefully tighten the screws after connection.

### The position of digital input terminals on the rear terminal



The external digital input terminal

### External switch connection



### Contact specifications

Item	Content
External switch	Directly connect to the terminal, when the trigger conditions is "switch", close up starting recording and switching off recording 16-channel recorder does not have this function

## 2.7 24VDC Transmitter Power Wiring (Option)

### Transmitter power output

#### CAUTION

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

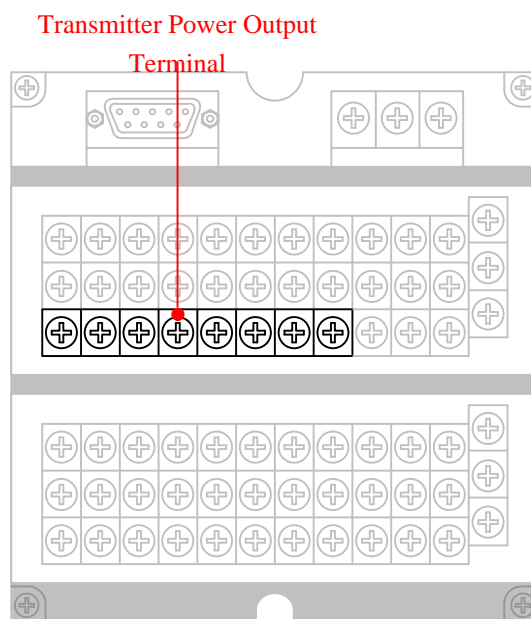
#### Wiring Procedure

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

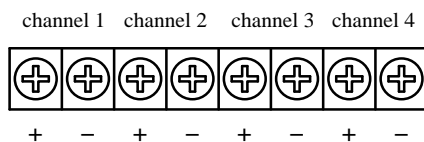
#### Note

- Remove the cover for the option terminal can be expediently to wiring. To prevent contact badness, replace the terminal cover and fasten it with screws.

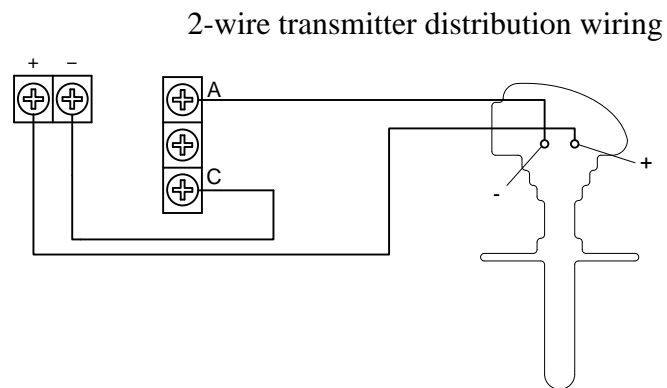
### The position of transmitter power output terminal in the rear terminal



### Output channel arrangement of transmitter power



## Wiring Diagram



### 24VDC Transmitter Power Supply

Loop: 4

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

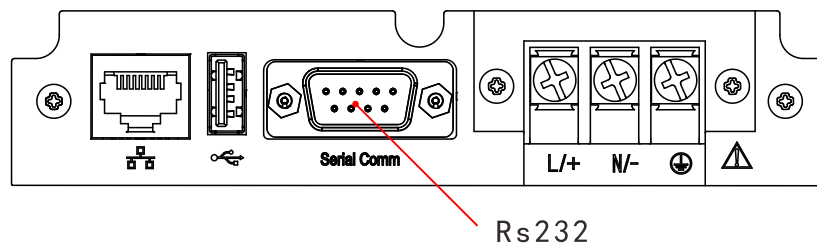
Maximum output current: 65mADC (over-loading protects current: about 90mADC)

## 2.8 RS232C/RS485 Communication Wiring

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

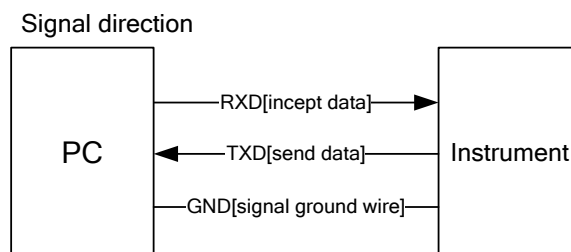
### Wiring Procedure

RS232C Communication wiring position in the rear instrument.

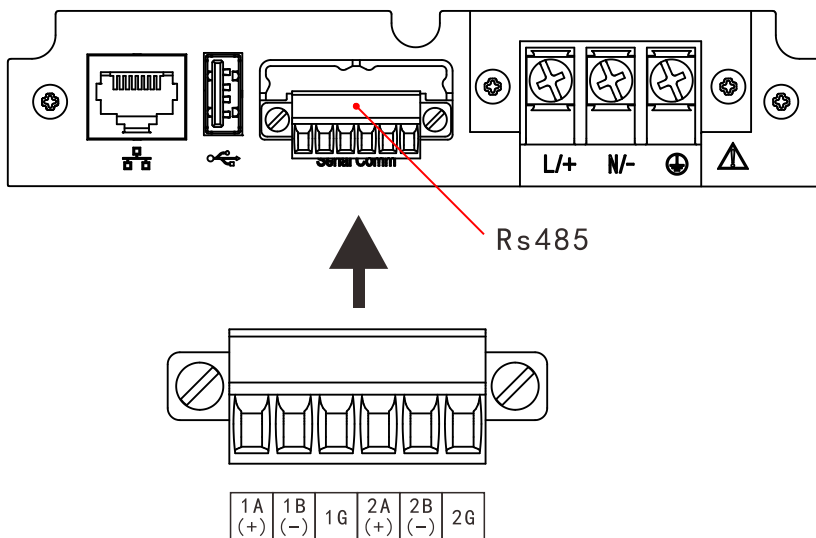


Pin	Signal Name	Description
2	RXD	Receive data from the RS232 interface, and the instrument input signal
3	TXD	Send data to the RS232 interface, and the instrument output signal
5	GND	Signal Ground

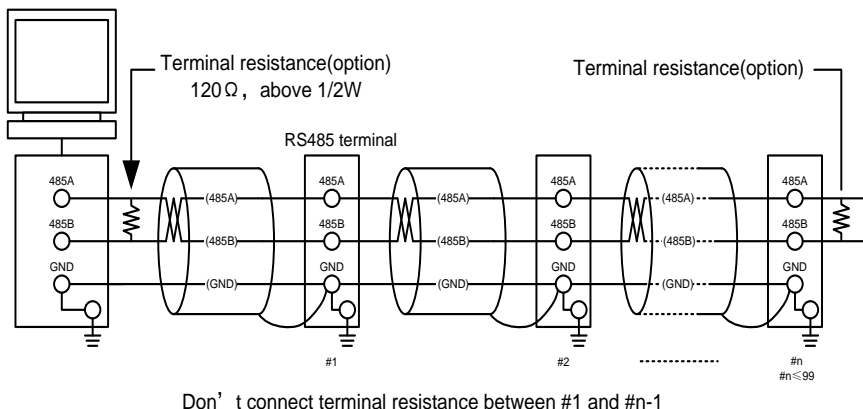
### RS232C connection



### RS485's position in the rear instrument



### RS485connection



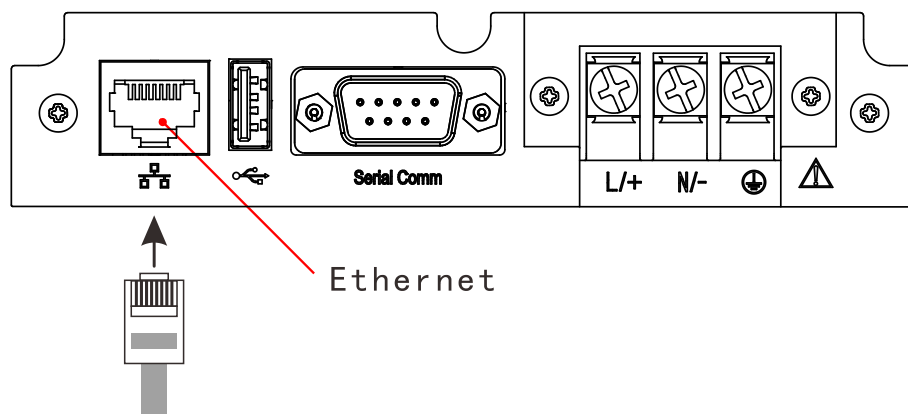
### Communication Specifications

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

## 2.9 Connect Ethernet (Option)

Here explains Ethernet communication wiring. Be sure to read this part before connecting.

### Wiring Procedure



Use network cable connector to connect RJ45 connector.

For Ethernet parameter setting, please refer to the communication parameter setting section.

### Communication Specification

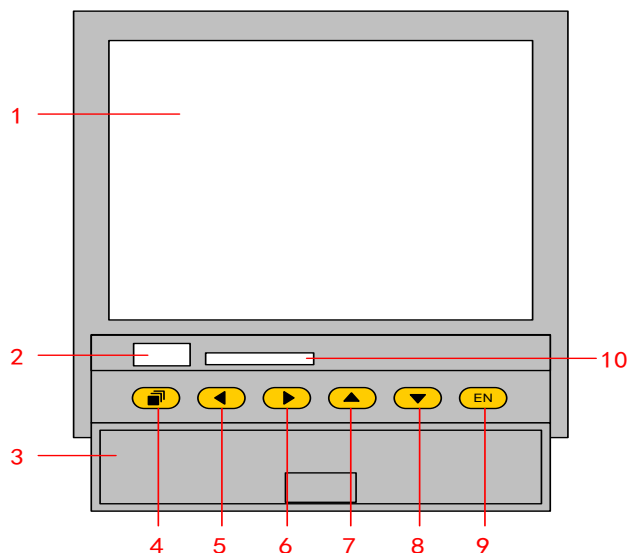
Item	Content
Specification	10Base-T



## Chapter 3 Names of Parts/Common 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

Move cursor to left in run mode and setting mode, used to search forward.

#### 6. RIGHT key

Move cursor to right in run mode and setting mode, used to search afterward.

#### 7. UP key

Increase the value that cursor indicated, and switches channels on the screen.

#### 8. Down key

Decrease the value that cursor indicated, switches compress ratio on the screen.

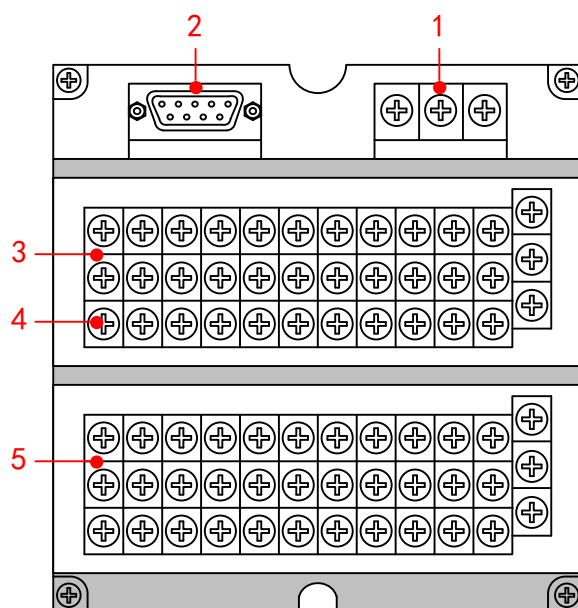
#### 9. ENTER key

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. Power terminals

Connect the power cord and ground protective line.

### 2. RS232 Port and RS485 Port

RS-232 port/ RS485 port is used to connect the interface cable.

### 3. Relay output terminals

Connect the relay output alarm cable.

### 4. 24 VDC Power Supply for Transmitter

Provide 24 VDC power line to transmitters.

### 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 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.

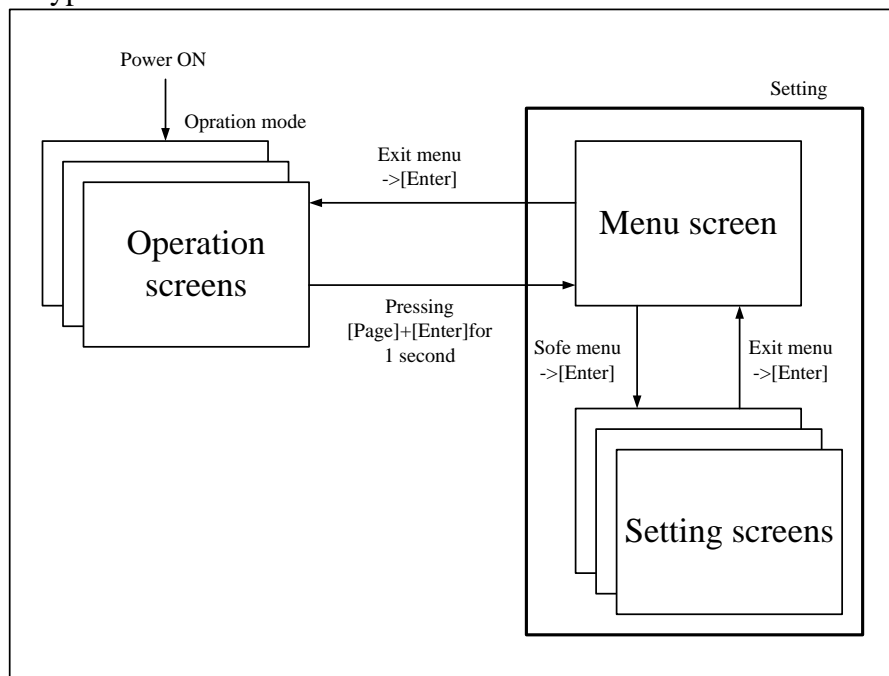
### Specification

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

## 3.4 Configuring the Functions

### Setting Mode

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

---

#### Note

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

---

### Setting Items

User can carry out the following content in Configuration mode:

- **Setting system parameters**
- **Setting 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

### 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

#### Enter the function screen

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



#### Select Function screen

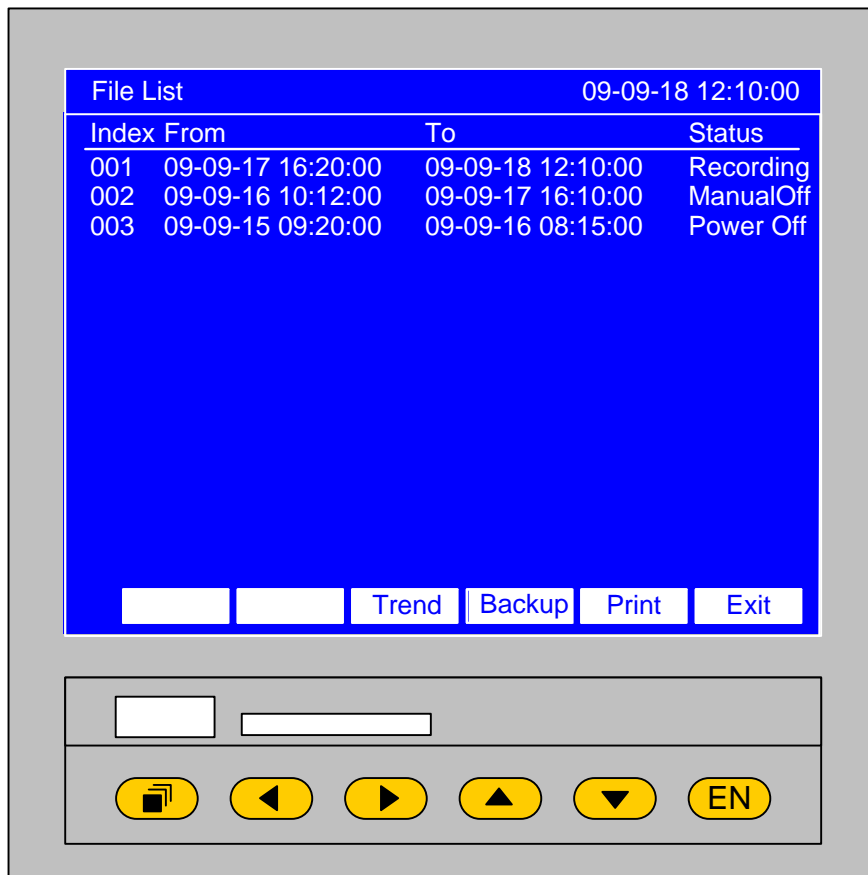
1. Use the [left and right button] to move the cursor
2. Use the [Enter] to enter the corresponding screen

The screenshot shows a blue background with white text. At the top left is 'File List' and at the top right is '2009-09-18 00:53:24'. Below this is a table with four columns: Index, From, To, and Status. A cursor is pointing to the first row. At the bottom right, there is a 'Menu' button.

Index	From	To	Status
001	09-09-17 16:20:00	09-09-18 00:53:24	Recording
002	09-09-16 18:13:00	09-09-17 16:16:00	ManualOff
003	09-09-15 16:12:00	09-09-16 16:15:00	Power Off

**Key operations in menu bar**

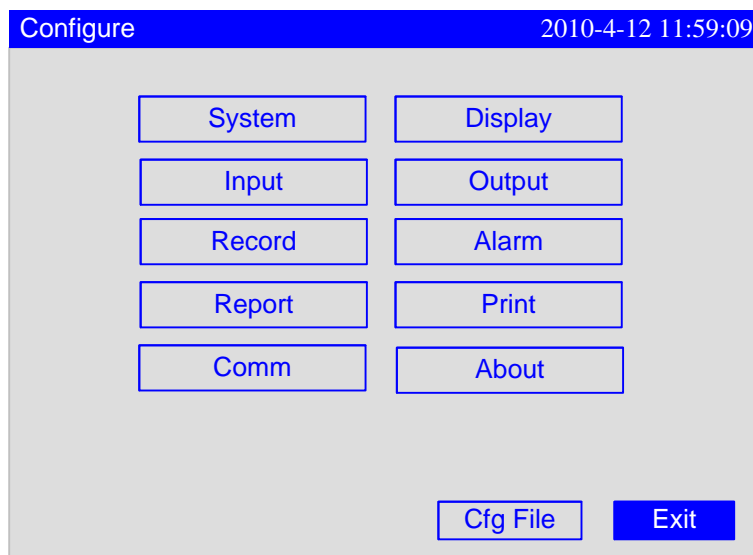
Use [Enter] key to start menu bar, click the button corresponding to the key name to perform the operation.



## Key operations in the Configuration mode

Entering the Configuration mode

1. Under the running mode, Press [Page] and [Enter] to enter the Configuration screen.
2. Move the cursor and press the [Enter] to enter 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.

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.

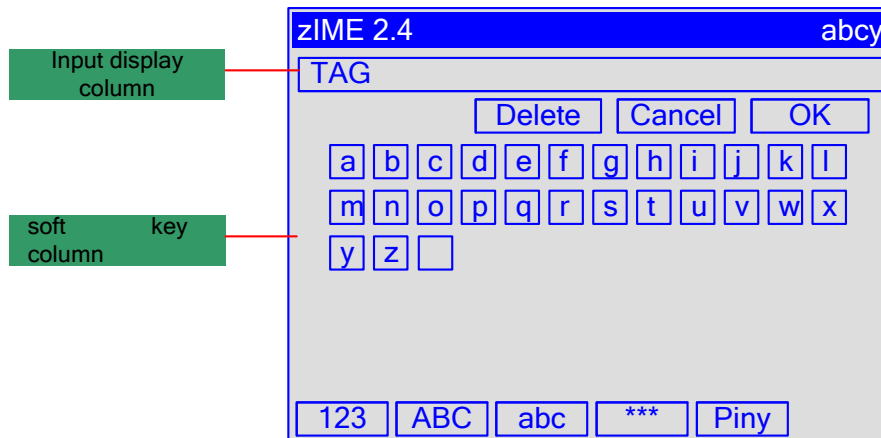
Selecting input parameter

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.

## Chapter 4 Display Screens and its Function

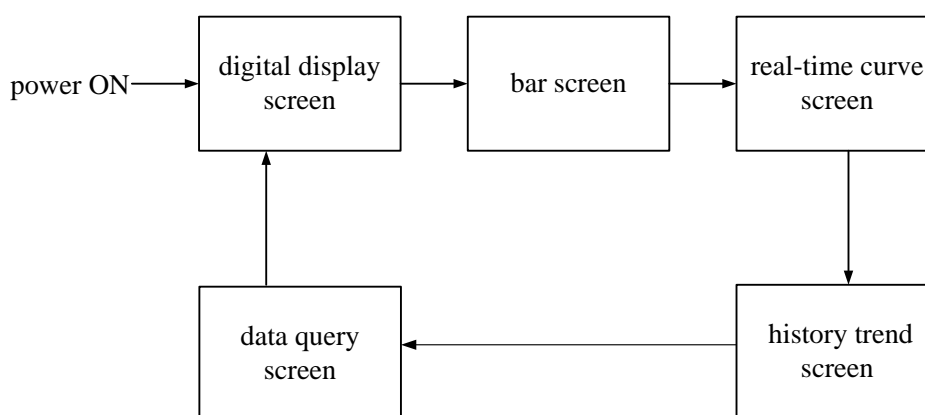
### 4.1 Switching Operation Screen.

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.

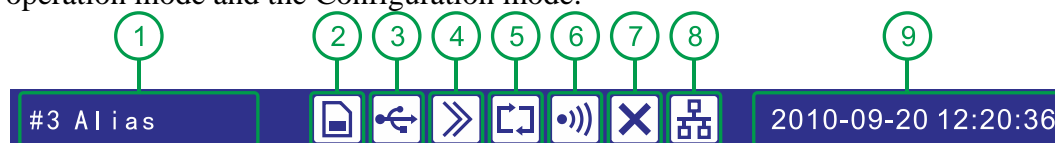
Alarm summary, data print (additional function) and backup (additional function), the cumulative report (additional specification), power-down recording and system logs and other screens enter through the data query screen.













Use the [Page] key to switch each screen.



## 4.2 Status display section

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



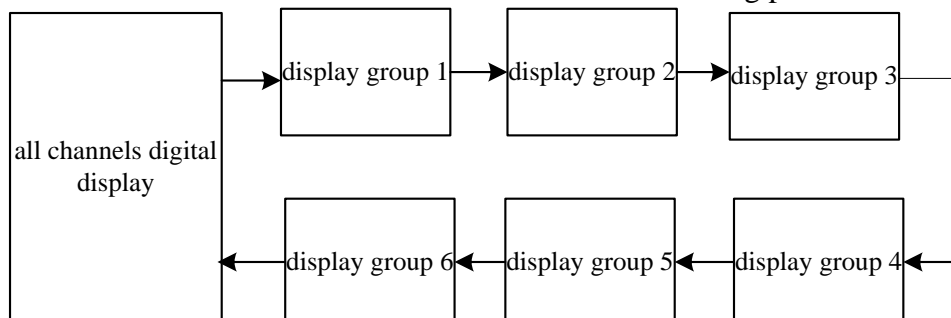
NO.	Function	Icon	Description
1	Title bar		It shows combination number or. <i>device name</i> .
2	SD card	None	There isn't an SD card or it fails to connect the SD card.
			The SD card is successfully connected.
			It is writing data with the function of automatic backup. (Icons will shift on the display.)
3	USB drive	None	The meter is no connected with a USB drive or it fails to connect with a USB.
			The meter is connected with a USB drive.
4	Loop Playback	None	The screen shows a certain picture. It won't be played in a cycle play mode.
			It will show every display group in loop playback mode.
5	Storage record mode		In a cycle record mode, the files are being recorded.
			In a cycle record mode, the files stop being recorded.
			Not in a cycle record mode, the files are being recorded.
			The files stop being recorded not in a cycle record mode.
6	Rely output	None	There isn't any rely output.
			There is rely output.
7	Abnormal I/O card	None	The I/O card works well.
			The I/O card doesn't work well. (Please contact with the supplier.)
8	Ethernet	None	This product doesn't have Ethernet function.
			Normal connect with Ethernet
			Abnormal connect with Ethernet (disconnect or IP address conflict)
9	Time		The date and time when the meter is operating

### 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』.

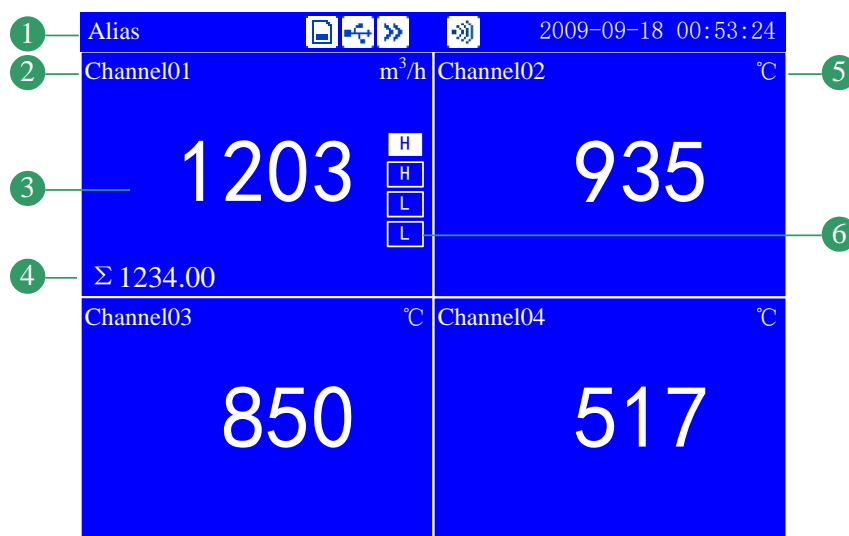
Use [up and down keys] to switch displayed combinations. It can display up to 6 combinations. If display of combinations don't show Configuration, skip this display combinations.

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 resistance 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』

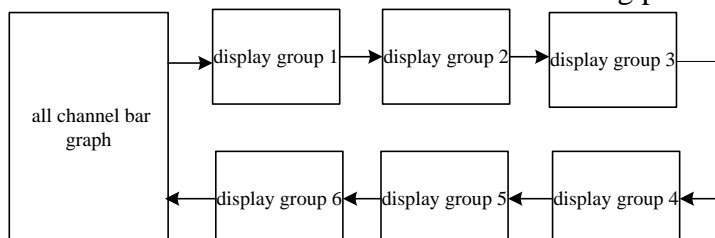
6. Alarm symbol. 4-channel alarm can be set up, green is normal, red is alarm.

## 4.4 Bar Graph Display

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

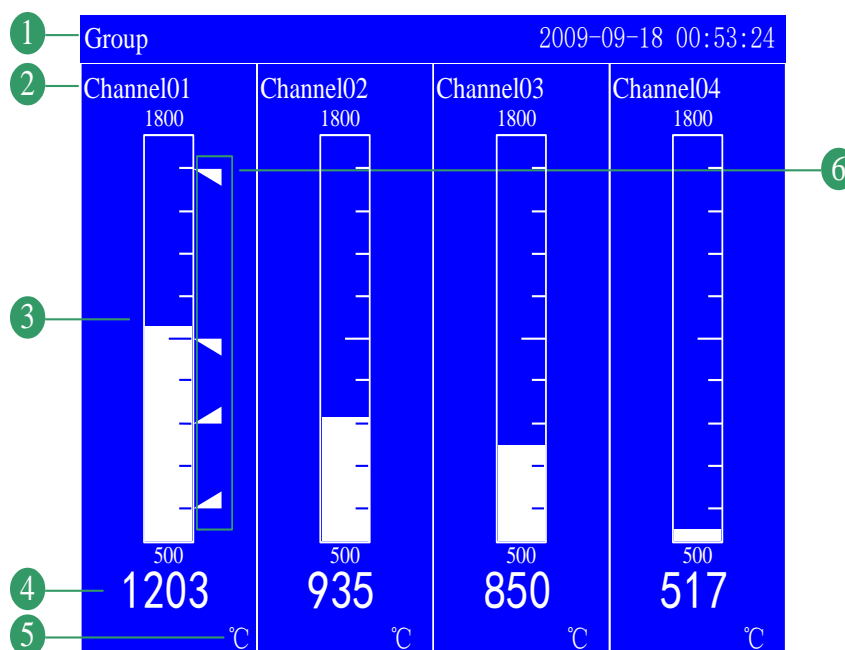
Using [up and down keys] to switch combinations of display. It can display up to 6 combinations. If display of combinations don't show Configuration, skip this display combinations.

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:



Show combination numbers, all channels show 【device name】

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

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.

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] displays an error flag.

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

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

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.

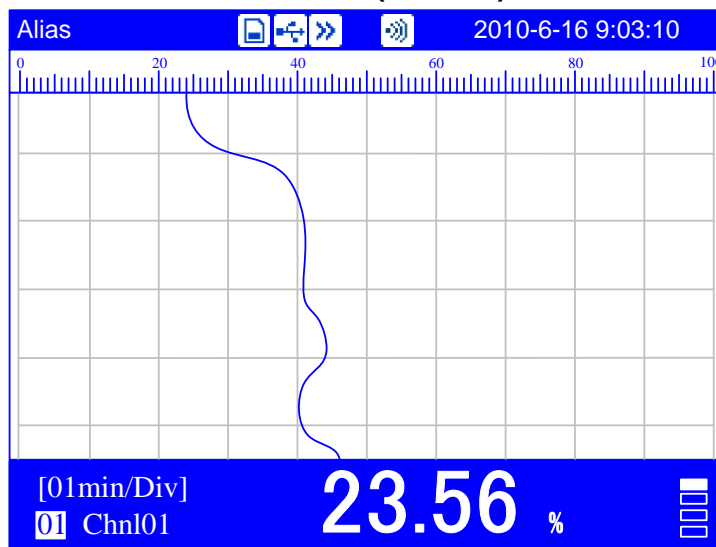
## 4.5 Real-Time Trend Screen

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

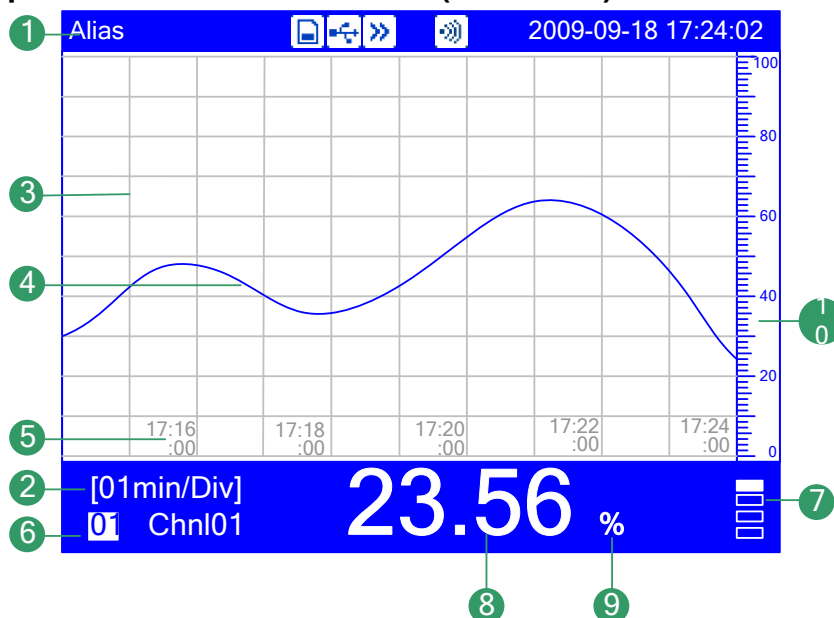
Using [up and down keys] to switch display channel.

Use [Enter] to start or stop the automatic switching function of display channel, 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)





Display combination number, if there is no combination, then show 【device name】  
Trend cycle. Each grid means the length. The cycle is related with recording interval, each grid time length = recording interval  $\times$  30.

Grid. Estimate the time and data value.

Data trend. Each screen can show 6 trends simultaneously at the most.

Time of the current grid.

Channel tag, which can be set. With regard to setting method, See section 『Channel Tag and Unit Setting』. Background color is the same as the corresponding trend color of this channel.

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.

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.

---

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

Scale: Display the percentage of the trend.

### Curve refresh

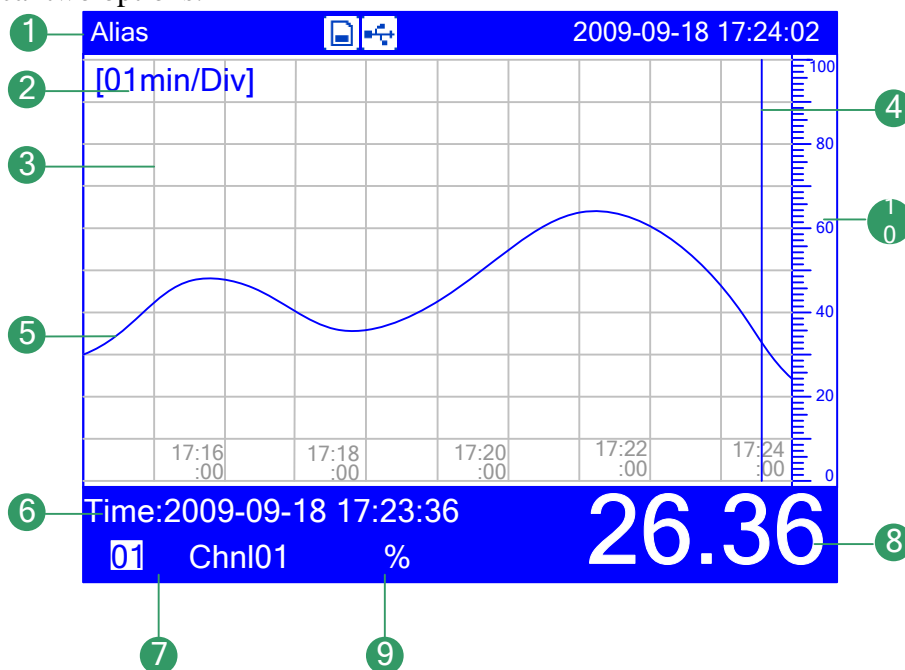
Every pixel in the timeline of LCD screen timeline represents a record of each interval. Each interval in the curve moves once.

## 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 trends. One is searching mode and the other is cursor mode. Historical Curves show no alarm.

Curve direction on paper is according to the Configuration display, with horizontal or vertical two options.



Display combination number, if there is no combination, then show 【device name】  
Trend cycle. Each grid means the length. The cycle is related with recording interval, each grid time length = recording interval × 30.

Grid. Estimate the time and data value.

Searching stick. Estimate the time and data value.

Data trend. Each screen can show 6 trends simultaneously at the most.

Searching time. Show the time where the cursor is located in the trend.

Data searching type. There are two types: searching mode and cursor mode.

Channel tag, which can be set. With regard to setting method, See section 『Channel Tag and Unit Setting』. Background color is the same as the corresponding trend color of this channel.

Historical data of channels. Show the data of channels that the Meter recorded.

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

Display / hide trend sign. “√” display trend, otherwise hide trend.

Scale. Display the percentage the trend.

Procedure:

Searching type: Cursor mode

**Switching curve combination**

Using [up and down keys] to switch display channels

Cursor mode searching 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 searching mode

Press [En] to switch to the searching mode.

Searching type: Searching mode

Searching operation in 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.

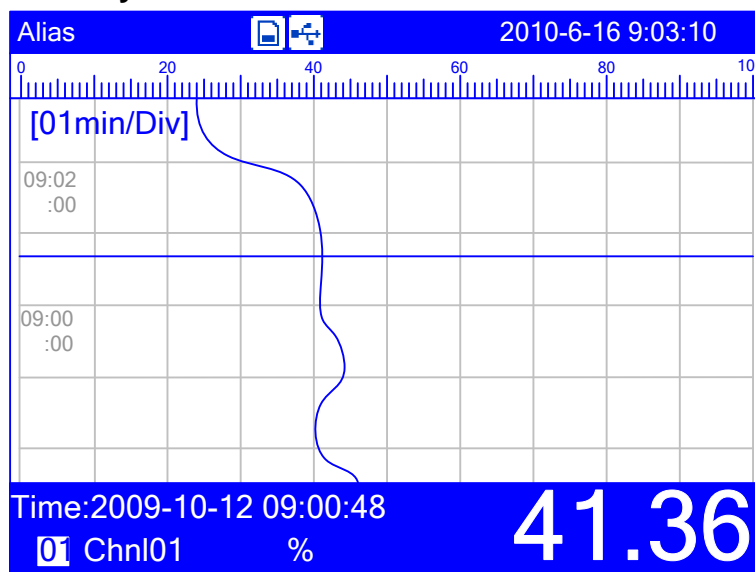
**Display or hide a trend**

Use [Left] [Right] to move the cursor to the display / hide trend sign, and use [Up] [Down] to hide or display trend.

Switch the searching mode

Press [En] to switch to the cursor mode.

## Longitudinal history curve



### Procedure:

Searching type: Cursor mode

#### Switching curve combination

Using [up and down keys] to switch display channels

Cursor mode searching 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 searching mode

Press [En] to switch to the searching mode.

Searching type: Searching mode

Searching operation in 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.

#### Display or hide a trend

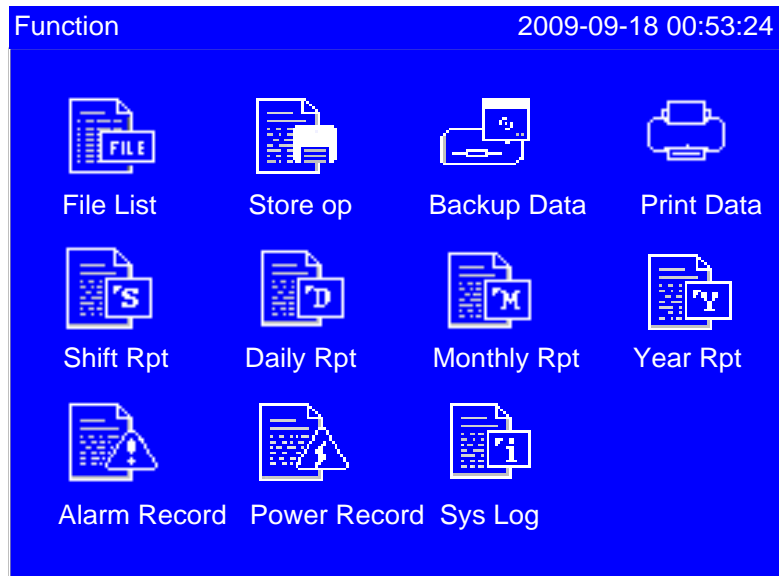
Use [Left] [Right] to move the cursor to the display / hide trend sign, and use [Up] [Down] to hide or display trend.

Switch the searching mode

Press [En] to switch to the cursor mode.

## 4.7 Function Screen

The screen entrance for the instrument internal data (historical data, alarm list, accumulation, accumulative reports, and power-down recording and system logs) to backup, print, view, etc.



### Operation:

- Use [left and right button] to move the cursor
- Use [Enter] key to enter the corresponding screen

## 4.8 File List

Display the file storage information and file storage status.

On the display method, please refer to the section 『switch the running screen』

File List		2009-09-18 00:53:24		
Index	From	To	Status	
▶001	09-09-17 16:20:00	09-09-18 00:53:24	Recording	
002	09-09-16 18:13:00	09-09-17 16:16:00	ManualOff	
003	09-09-15 16:12:00	09-09-16 16:15:00	Power Off	

Total: 3 Menu

Number: Records arranged by time, the nearer the occurrence time is, the more preceding it will be arranged.

Starting time: the starting time of data record in the file.

Ending time: the ending time of data record in the file.

Status: Display the file record state of current file, file state is as follows:

Being recorded: the file is recording data;

Manually stop: to stop recording because of changes in the Configuration data or manually key operation;

Power-down stop: to stop recording because of power down;

Alarm stop: to stop recording because of cancellation of alarm;

Switch stop: to stop recording because of the disconnection of the external switching device;

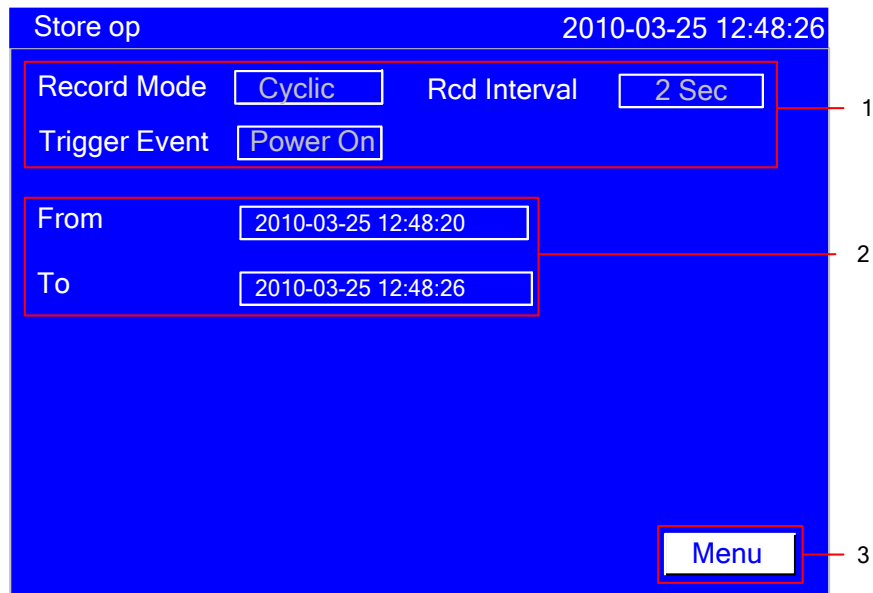
Time stop: to stop recording because the file reaches the set time for the end of record.

Menu: Use the [up and down keys] to move the arrow to the file number you want to view, use the [Enter] to enter: Press [Trend key] to skip to the historical trend screen and view the historical trend data, use the [Page] to return to the file list screen; press [backup] to skip to the history data backup screen for a single file, and back up the historical data, 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 the information set by the record Configuration and file storage condition, for the recording Configuration setting, please refer to the 『recording Configuration setting』 section.

On the display method, please refer to the section 『switch running screen』



The instrument records the Configuration information.

The starting time and ending time of file storage.

Menu: When the record Configuration trigger is set to be manual, use the [Enter] to enter: Press [Start key], then the instrument starts recording; Press [Stop key], then the instrument stops recording.

**Note:** The Storage interface display varies with the record Configuration setting.

## 4.10 Data Backup

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

Backup Data		2009-09-18 00:53:24
Backup Content	All History Files	
File Folder Name	20090918.002	
		Backup(USB)
		Backup(SD)

Backup Data		2009-09-18 00:53:24
Backup Content	Single History File	
File Name	DAT0000.RDZ	
File Index	1	
From	2009-9-17 08:04:32	
To	2009-9-17 11:20:12	
		Backup(USB)
		Backup(SD)

### Procedures:

Connect USB or SD cards in a right way, after connecting there's a corresponding icon in the system column.

Press the [Up and down] keys to select backup content, including all historical data, historical data of single file, alarm record, power-down record, system log, accumulative shift report, accumulative daily report, accumulative monthly report, accumulative annual report

When backing up the historical data for single file, use the [up and down keys] to adjust the file index; and set the start time and end time

Modify the folder name or file name, use the [up and down keys] to adjust the file



number; use the [En] to edit the file name.

Back up your data, move the cursor to **【Backup (USB / SD)】** button, press [En] key to perform a data- backup manipulation.

For backing up all the historical data, the file storage path is Data / **【Instrument Name】** / folder name. For backing up other data, the file storage path is Data / **【Instrument Name】** / file name. For the **【device name】** ,please check the system Configuration screen.

Use [Page] to return to data query screen.

## 4.11 Data Printing

This section describes how to use the mini-printer to print historical data. On the way to display, please see the section 『switching the running screen』

Print Data		2009-09-18 00:53:24
From	<input type="text" value="2009-09-16 10:20:30"/>	
To	<input type="text" value="2009-09-16 12:20:30"/>	
Channel	<input type="text" value="通道02"/>	
Interval	<input type="text" value="2"/>	
File Index	<input type="text" value="3"/>	
		<input type="button" value="Print Data"/>
		<input type="button" value="Print Curve"/>

### Steps:

1. connect mini-printer properly.
2. Set the start time and end time.
3. Set print channel (or combination) and print interval.
4. Printing curves or data.
5. Use [Page ] to return to data query screen.

### Description

Connect the instrument and the printer through the RS232C interface (DB9).

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

Instruments do not need to set the communication parameters.

## 4.12 Alarm Summary

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

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

Alarm Record				2009-09-18 00:53:24	
Index	Status	Chnl	Type	Time	
001	On	01	1 H	2009-09-15 16:17:00	
002	Off	01	1 H	2009-09-15 16:16:00	
003	On	01	2 L	2009-09-15 16:15:00	
004	Off	01	2 L	2009-09-15 16:14:00	
005	On	01	1 H	2009-09-15 16:13:00	
006	Off	01	1 H	2009-09-15 16:12:00	

0 0 0 1  
 1 02 03 4 5 06 07 08 09 10 11 2 Menu

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

**Status:** Displays the current record status, alarm, or report cancel

**Channel:** Displays the channels of current record

**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).

**Alarm time.** Displayed the alarm occur

**Relay state.** Display current relay output state.

Relay type	Normal open relay	Normally closed relay
Green	open	closed
Red	closed	open

**Menu:** press [Enter] to enter, and press [Back up] to skip to the data backup screen for alarm record backup; press [Exit] to return to current record screen.

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

Use [Page] to return to data query screen

## 4.13 Accumulative Report

### 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.

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

Shirt Rpt		2009-09-18 00:53:24	
Chnl	Channel01	Date	2009-09-12
2009-09-11:			
A	8498.60		
B	202.10		
C	0.00		
Σ8700.70		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: Press [Enter ] to enter, and press [Back up ] to skip to the data backup screen for accumulative shift report backup; press [Print] to use micro-printer for printing screen display content; press [Enter] to return to the current accumulative shift report screen.

Use [Page] to return to data query screen.

## 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		2009-09-18 00:53:24	
Chnl	Channel01	Date	2009-09-12
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	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: Press [Enter ] to enter, and press [Back up ] to skip to the data backup screen for accumulative daily report backup; press [Print] to use micro-printer for printing screen display content; press [Enter ] to return to the current accumulative daily report screen.

Total: Display the total volume per day.

Use [Page] to return to data query screen.

## 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		2009-09-18 00:53:24
Chnl	Channel01	Time 2009-09
01:	0.00	23: 0.00
02:	0.00	24: 0.00
03:	0.00	25: 0.00
04:	0.00	26: 0.00
05:	0.00	27: 0.00
06:	0.00	28: 0.00
07:	0.00	29: 0.00
08:	0.00	30: 0.00
09:	0.00	
10:	0.00	
11:	0.00	
12:	0.00	
13:	0.00	
14:	0.00	
15:	0.00	
16:	0.00	
17:	0.00	
18:	0.00	
19:	0.00	
20:	0.00	
21:	0.00	
22:	0.00	
Σ0.00		Sum:0.00
		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: Press [Enter ] to enter, and press [Back up ] to skip to the data backup screen for accumulative monthly report backup; press [Print] to use micro-printer for printing screen display content; press [Enter ] to return to the current accumulative monthly report screen.

Total: Display the total volume per month.

Use [Page] to return to data query screen.

## 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		2009-09-18 00:53:24	
Chnl	Channel01	Time	2009
2009-01:	0.00		
2009-02:	0.00		
2009-03:	0.00		
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		
Σ0.00		Sum:0.00	Menu

### Operation:

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

Menu: Press [Enter] to enter, and press [Back up] to skip to the data backup screen for accumulative annual report backup; press [Print] to use micro-printer for printing screen display content; press [Enter] to return to the current accumulative annual report screen.

Total: Display the total volume per year.

Use [Page] to return to data query screen.

## 4.14 Power-Down Record

Display time of power-down and power-on records, including the power-down and power-on time, power-down frequency and the total time of power-down.

It can save up to 512 power-down record.

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

Power Record		2009-09-18 00:53:24
Index	Power off	Power on
001	2009-09-15 16:22:00	2009-09-15 16:23:00
002	2009-09-15 16:20:00	2009-09-15 16:21:00
003	2009-09-15 16:18:00	2009-09-15 16:19:00
004	2009-09-15 16:16:00	2009-09-15 16:17:00
005	2009-09-15 16:14:00	2009-09-15 16:15:00
006	2009-09-15 16:12:00	2009-09-15 16:13:00
007	2009-09-15 16:10:00	2009-09-15 16:11:00
008	2009-09-15 16:08:00	2009-09-15 16:09:00
009	2009-09-15 16:06:00	2009-09-15 16:07:00
010	2009-09-15 16:04:00	2009-09-15 16:05:00
011	2009-09-15 16:02:00	2009-09-15 16:03:00
012	2009-09-15 16:00:00	2009-09-15 16:01:00

Total:12 ShutDown:12 Times/0d1m19s Menu

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, and display the accumulated time for each power-down time, accurate to seconds.

Menu: press [En] to enter, and press [back up ] to skip to data backup screen for power-down record backup; press [Exit] to return to the current power-down record screen.

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

Use [Page] to return to data inquiry screen.



## 4.15 System Log

Display related log of instrument operation.

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

### Operation:

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

Use [Page] to return to data query screen.

Sys Log		2009-09-18 00:53:24
Index	Event	Time
001	Enter Config	2009-09-15 16:23:00
002	Save Input Config	2009-09-15 16:21:00
003	Save Report Config	2009-09-15 16:19:00
004	Enter Config	2009-09-15 16:17:00
005	Enter Config	2009-09-15 16:15:00
006	Save Record Config	2009-09-15 16:13:00

Total:6 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 [En] to enter, and press [Back up] to skip to the data backup screen for system log backup; press [Exit] to return to the current system log screen.

## 4.16 Log Configuration

This section describes how to log Configuration.

### Operation

Press the [next page] plus [En] to enter the login screen, enter the password, If the password is correct then display Configuration entry, select the appropriate Configuration entry to set the Configuration; password error could not enter.

Login 2010-6-16 10:32:39

Password 000000 ▾

Exit

R5GV2001 11/01/21 [PN100222]

Configure 2010-4-12 11:59:09

System	Display
Input	Output
Record	Alarm
Report	Print
Comm	About

Cfg File Exit

Press **【Quit】** button to exit Configuration and enter the running screen.

## Chapter 5 System Configurations and its Function

### 5.1 Set the Device Name\Date\Language\Password\RJC

The screenshot shows a configuration window titled 'System' with a timestamp of '2010-4-12 11:59:09'. The window contains the following fields and buttons:

- Alias:** A text input field containing 'Alias'.
- System time:** A date and time selection field showing '2009-10-01 08:00:00'.
- Language:** A dropdown menu currently set to 'English'.
- Password:** A text input field containing '000000'.
- CoolAdjust:** A numerical input field containing '25.0'.
- Buttons:** Three buttons are visible: 'Factory-set', 'Purge data', and 'Exit'.

1. Alias name; display it on the title bar. Use that name to create the directory of data backup and automatic backup.
2. System Time: This field is to set meter's current date and time.

---

#### Caution

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

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

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

After setting system date / time, please clear the data

---

3. Display language (Chinese and English).
4. System password is used to modify Configuration parameters and prevent the system parameters from being accidentally modified. System password is six digits.
5. Reference junction compensation can tune compensation temperature value of thermocouple. (Range  $\pm 0.5$ )

## 5.2 Implementation of the Factory Settings

This section describes the instrument functions of the factory settings and parameters of reset value.

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

### Operation

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

The screenshot displays the 'System Configuration' screen. At the top, a blue header bar shows 'System' on the left and the date and time '2010-4-12 11:59:09' on the right. Below the header, the following settings are visible:

Alias	<input type="text" value="Alias"/>
System time	<input type="text" value="2009-10-01 08:00:00"/>
Language	<input type="text" value="English"/>
CoolAdjust	<input type="text" value="25.0"/>
Password	<input type="text" value="000000"/>

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

Use the [left and right button] to move the cursor to the **【factory setting】** button.  
Use the [En] to implement factory setting function.

**Reset instrument of Configuration parameter values**

Configuration	Parameter	Reset value	Note
System Configuration	device name	device name / Alias	The former in Chinese, the latter in English
	Date and time	Not affected	No change
	Language	Not affected	No change
	Password	000000	
	RJC	0.0	displayed as the cold-side plus adjustment
Display Configuration	Brightness	10	
	Trend direction	horizontal	
	The first screen	Overview screen	
	channel	OFF	
Input Configuration	Display tag	Channel xx / Channel xx	The former in Chinese, the latter in English
	Channel unit	%	
	Channel type	Current	
	Signal type	4-20mA	
	Precision	2	
	Signal range	4.00 ~ 20.00	
	Display range	0.00 ~100.00	
	Adjust value K	1.00	
	Adjust value B	0.00	
	burnout	--	
	filter	0.0 second	
Output Configuration	Channel	OFF	
	Adjust value K	1.00	
	Adjust value B	0.00	
Recording Configuration	Recording mode	circular	
	Recording type	Real-time value	
	Recording interval	2 second	
	Automatic backup	no	
	Trigger condition	Power-down	

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	Precision	2	
	Settlement time	00	
	Shift report number	3	
	Display tag	Shift A Shift B Shift C	
	Starting time	00:30~08:30 08:30~16:30 16:30~00:30	
	Accumulation allowed	Closed	
	Initial value	0.00	
	Ratio	1.00	
Print Configuration	Key printing	no	
	Timer print	no	
	Timer interval	00:02(H:M)	
	Print Blank	no	
	Print Type	All	
Communication Configuration	Communication address	001	
	bytes exchange	2-1 4-3	
	Baud rate	115200	
	parity	none	

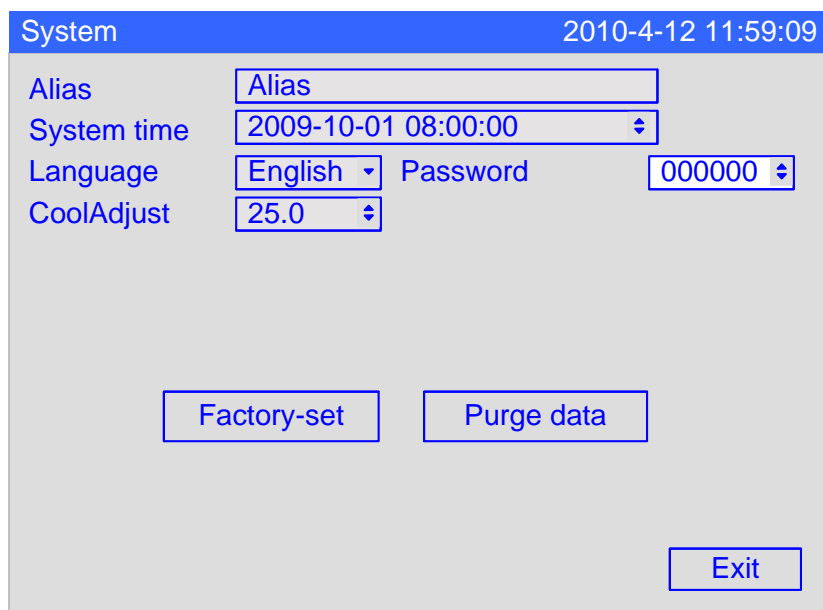
### 5.3 Implementation of Purging Data

This section describes the instrument functions of purging data.

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

#### Operation

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



The screenshot displays the 'System' configuration screen. At the top, the title 'System' is on the left and the date and time '2010-4-12 11:59:09' are on the right. Below the title bar, there are several configuration items, each with a text box or dropdown menu:

- Alias: Alias
- System time: 2009-10-01 08:00:00
- Language: English
- Password: 000000
- CoolAdjust: 25.0

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

Use the [left and right button] to move the cursor to the **【purge data】** button.

Use the [En] to clear data function.

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 Mode\Type\Interval of Recording and Automatic Backup

Record		2010-4-12 11:59:09	
Record Mode	<input type="text" value="Cyclic"/>	Rcd Type	<input type="text" value="Real"/>
Rcd Interval	<input type="text" value="1Sec"/>	Auto Backup	<input type="checkbox"/>
Trigger Event	<input type="text" value="Manual"/>		
		<input type="button" value="Purge record"/>	<input type="button" value="Exit"/>

- This section describes the method of instrument recording mode setting. The recording mode of this instrument has 2 types: circular and non-circular. Circular: When the last file recording in the instrument is full, it will continue to record from the first file, according to replacing the old file by the new one to record the historical data circularly. Non-circular: When the last file recording in the instrument is full, stop recording automatically.
- 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
- Record Interval: This field is used to set recorded interval. Optional recording interval: 1 second, 2 seconds, 5 seconds, 10 seconds, 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes, 30 minutes.



---

**NOTE**

After modifying the record interval, the records which is being stored will be interrupted.

---

7. Automatic backup: every day at 0:00, the instrument will automatically back up the historical data to SD card; when stopping recording or reaching trigger conditions set by the user, the instrument will also automatically back up historical data to the SD card.
8. Automatic backup file storage directory:
  1. backup file storage directory at 0:00 every day: Data / **【Device Name】** / instrument date (Year \_ Month/ AU to\_ date (day). RDZ
  2. Other automated backup files storage directory: Data / **【Device Name】** / instrument date (Year \_ Month) / day / instrument time (hours \_ \_ minutes seconds). RDZ

## 6.2 Set the Trigger Condition

This section describes the method of trigger conditions setting.

Trigger conditions include manual operation, alarm, relay, switch, timing, and 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 to cause an alarm, and then start recording data storage; when the alarm ends, then stop recording.

Relay: can be set only in one channel corresponding to a relay to cause an alarm, and then start data storage records; when the relay alarm ends, and then stop recording.

Switch: Meter is connected to external switch equipment, when the switch is connected, and then begins recording data storage; when the switch is off, and then stops recording data storage.

Timing: Timing cycle period is fixed at 24 hours, set start time and end time for the instrument so that the instrument can only record data storage at the setting time every day.

Power: after the power is on each time, the instrument automatically creates a new file and start recording data

### Operation

Enter **【Recording Configuration】** screen, for the method to enter the screen, please refer to the section 『log Configuration』

Record		2010-4-12 11:59:09	
Record Mode	<input type="text" value="Cyclic"/>	Rcd Type	<input type="text" value="Real"/>
Rcd Interval	<input type="text" value="1Sec"/>	Auto Backup	<input type="checkbox"/>
Trigger Enent	<input type="text" value="Manual"/>		
		<input type="button" value="Purge record"/>	<input type="button" value="Exit"/>

Use the [left and right button] to move the cursor to **【trigger】** column.

Use the [up and down keys] to choose trigger conditions

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 Purge Historical Records

This chapter describes the methods to clear recording data in the instrument. It can only clear historical data, the total accumulation, accumulative reports, alarm list, power-down records, but the system log is not cleared.

Record		2010-4-12 11:59:09	
Record Mode	<input type="text" value="Cyclic"/>	Rcd Type	<input type="text" value="Real"/>
Rcd Interval	<input type="text" value="1Sec"/>	Auto Backup	<input type="checkbox"/>
Trigger Enent	<input type="text" value="Manual"/>		
		<input type="button" value="Purge record"/>	<input type="button" value="Exit"/>

### Operation

Enter **【Recording Configuration】** screen, for the method to enter the screen, please refer to the section 『log Configuration』

Use the [left and right button] to move the cursor to **【purge historical data】** column.

Use the [Enter] to purge data

Confirming operation

Select **【Yes】** to purge data.

Select **【Cancel】** or **【No】** to cancel purging historical records.

## Chapter 7 Set the Input Configurations

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

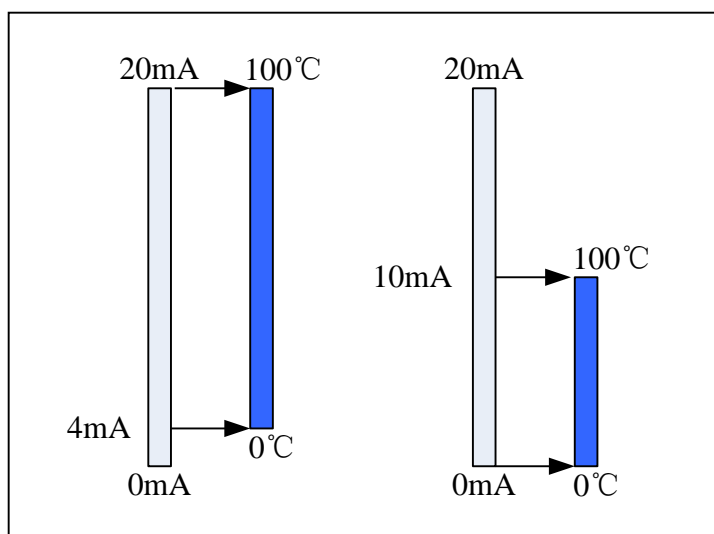
### Channel types and signal types

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

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

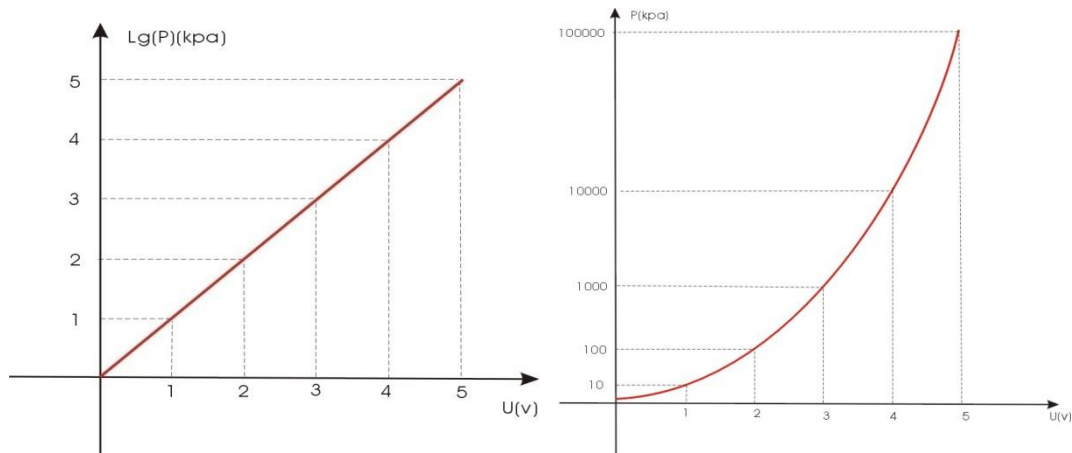
### Linear operation

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



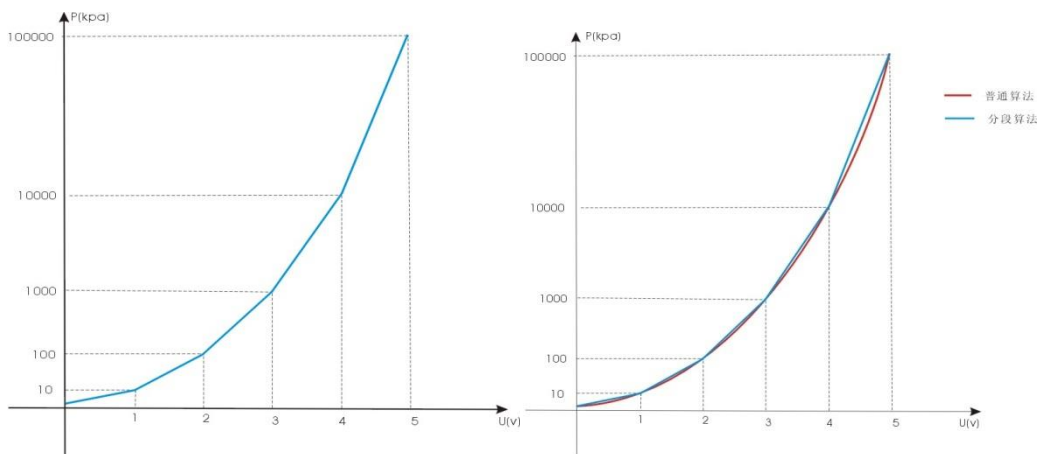
### Ordinary vacuum operation

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



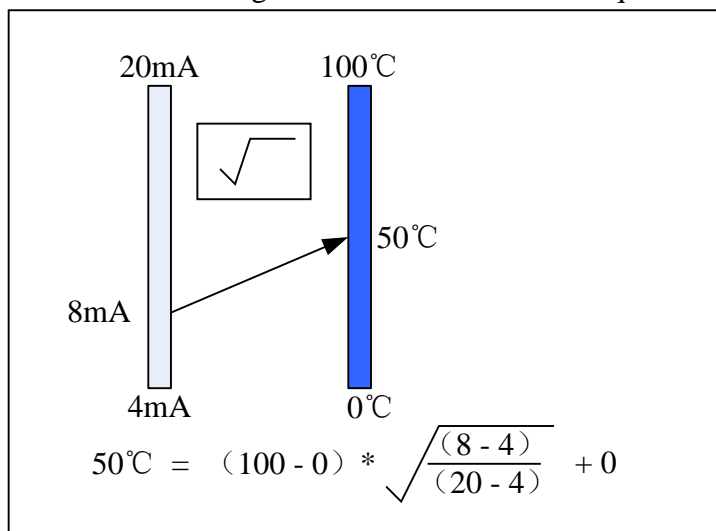
### Sub-vacuum operation

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



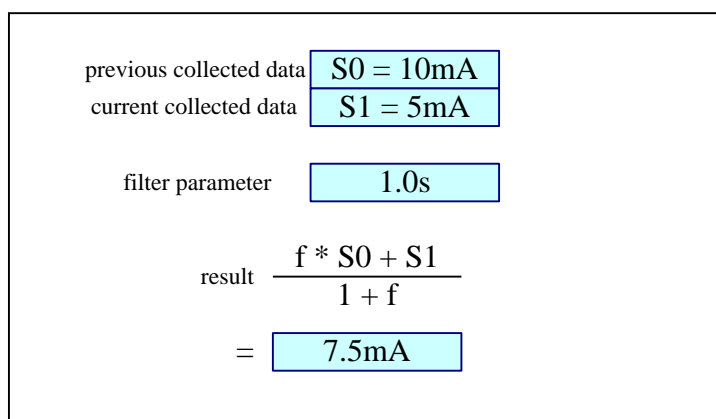
### Square root calculation

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



### Filtering operation

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



### Digital operation

Voltage: Access voltage signal: 0 ~ 1V, displayed as 0; When  $\geq 1\text{V}$ , displayed as 1.

Switch: Access RTD signal: 0 ~ 100  $\Omega$ , displayed as 0; When  $\geq 100\ \Omega$ , displayed as 1.

### Resection of the small-signal functions

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

## Line Regulation

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

## Burnout treatment

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

## Reference Junction Compensation

Reference junction compensation for thermocouple.

## Channel types and the computation relationship

	RJC	Removal of small-signal	Filter	Square root	Specific calculation	Adjust linear	treatment of burnout
<b>Current</b>		•	•	•	<b>Linear</b>	•	•
<b>Voltage</b>		•	•	•	<b>Linear</b>	•	•
<b>Resistance</b>		•	•		<b>Linear</b>	•	•
<b>Frequency</b>		•	•		<b>Linear operation</b>	•	
<b>Thermal Resistance</b>		•	•			•	•
<b>Thermocouple</b>	•	•	•			•	•
<b>Ordinary vacuum</b>			•		<b>General Vacuum</b>		
<b>Sub vacuum</b>			•		<b>Sub vacuum</b>		

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

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

**Signal Type Measurement Range**

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

**Note:**

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



## 7.1 Set Parameters for the Input Channel

Input		2010-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel01		
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	--		
Filter	0.0sec	Cut	0.0 %
		Copy01	Exit

1. Channel: channel number of the present showing parameter.
2. Channel closed: turn on or turn off the channel.
3. Channel tag number: the presenting tag number of the channel. 15 characters with mixed Chinese and English available.
4. Engineering unit: the presenting unit number of the channel. 7 characters with Chinese, English and special character available. The engineering unit doesn't participate in the calculating. It only offers the function of presenting.
5. Input mode: the input mode of the input channel. It is the classification of different channel type.
6. Signal type: the signal type of the input channel.
7. Signal scale: the signal scale of the input channel. The signal scale of thermal resistance and thermocouple can't be changed.
8. View scale: the view scale of the input channel.
9. Decimal digits: it shows the accuracy of the scale with a scope of 0-3.
10. Adjust: the adjustable function of linear channel. The quantities =  $K \times$  original quantities + b
11. Break line treatment: it deals with signals of the third type, thermal resistance and thermocouple. The treatment includes minimum value, maximum value, maintain, \_\_ (wrong signal).
12. Filter: the time parameter of the filter. The scope is of 0.0 - 9.9 second.
13. The cut of small signal: if the signal is below this value, it is the low limitation of the scale. The normal signal is between 0.0-9.9%. The frequency signal is between 0-99HZ.

## 7.2 Copy Channel Configuration

This section describes the channel Configuration replication.

### Operation:

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

Input		2010-4-12 11:59:09	
Channel	1	Disable	<input type="checkbox"/>
Tag	Channel01		
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	--		
Filter	0.0sec	Cut	0.0 %
		Copy01	Exit

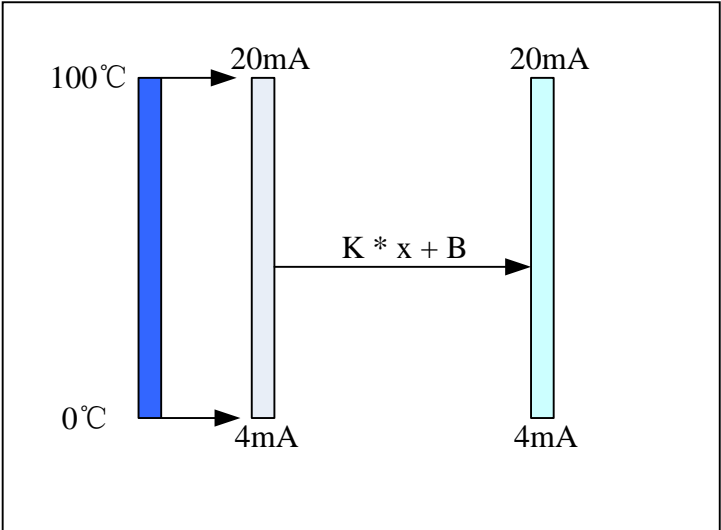
1. Use the [left and right button] to move the cursor to the **【channel】** .
2. Use the [up and down keys] to select the channel which needs Configuration.
3. Use the [left and right button] to move the cursor to the **【copy xx】** .
4. Use the [up and down keys] to copy the source channel.
5. Use the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



## 8.1 Set the Output Channel

Output		2010-4-12 11:59:09	
	Channel	Adjust(kX+b)	
1	01 ▾	1.00	0.00
2	01 ▾	1.00	0.00
3	01 ▾	1.00	0.00
4	01 ▾	1.00	0.00

1. Output channel: Source channel, can be closed.
  2. Output adjustment:
  3. The formula: new output current =  $k \times \text{original output current} + b$ .
- e.g.
4. If the original channel scale is  $0 \sim 100^{\circ}\text{C}$ , and the current scale is  $25^{\circ}\text{C}$ , adjust  $K=2.00$  and  $b = 3.00$ , then
  5. Before adjusting, output =  $(25 / (100 - 0)) * (20 - 4) + 4$  mA = 8mA
  6. After adjusting, output =  $K \times \text{output} + b = 2.00 * 8\text{mA} + 3.00 = 19\text{mA}$

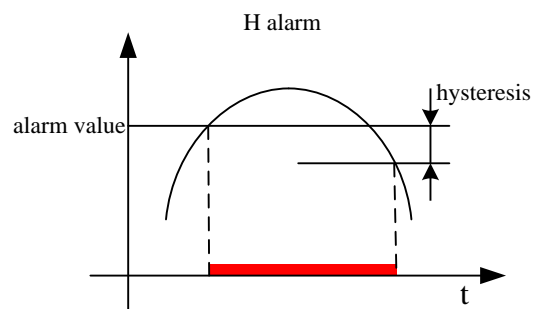
## Chapter 9 Set Alarm Configurations

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.

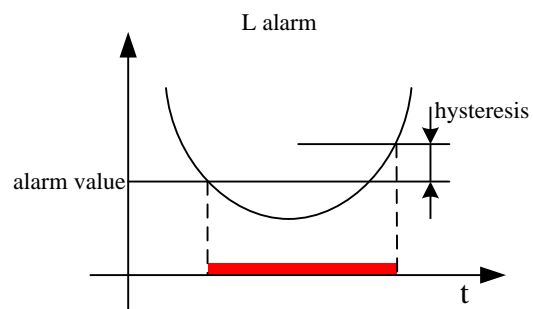
### H Alarm

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.



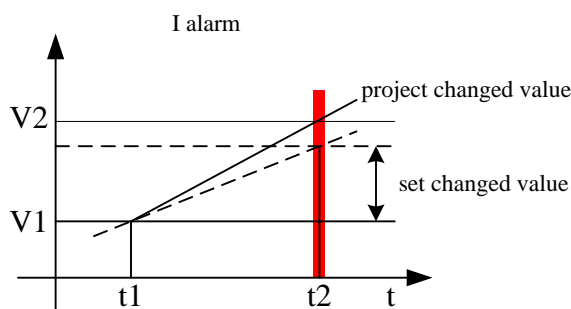
### L Alarm

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.



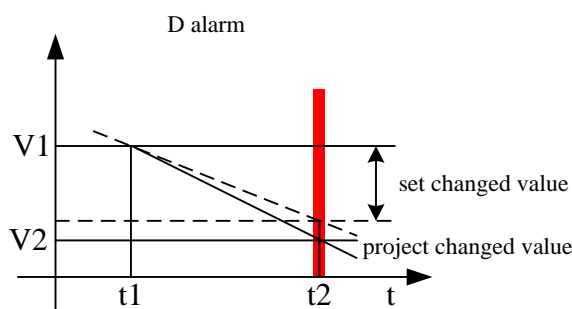
## I Alarm

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 1-12 or 1-8, when multiple alarms use the same one relay output, Use the stack output.

- Each alarm action and eliminating actions will have reported alarm information to form a warning list. The maximum of alarm list is 256.

## 9.1 Set the Alarm and Relay Contract

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

Operation:

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

The screenshot shows the 'Alarm' configuration screen with a blue header bar containing the title 'Alarm' and the timestamp '2010-6-16 10:54:58'. Below the header, there are several configuration fields: 'Channel' (set to 01), 'Relay Delay' (0sec), 'Hysteresis' (0.00), 'I Alm Time' (0sec), and 'D Alm Delay' (0sec). A table below these fields lists four alarm configurations. The 'Type' column has values H, L, L, L. The 'AlarmValue' column has values 16.00, 0.0, 0.0, 0.0. The 'Relay' column has values R01, R00, R00, R00. An 'Exit' button is located at the bottom right. Red boxes and lines highlight specific elements: '01' in the Channel field (1), the Type dropdowns (2), the AlarmValue fields (3), the Relay dropdowns (4), and the Exit button (5).

Alarm	Type	AlarmValue	Relay
1	H	16.00	R01
2	L	0.0	R00
3	L	0.0	R00
4	L	0.0	R00

Use [left

and right button] to move the cursor to the **【channel】**, use the [up and down keys] to select channel Configuration.

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.

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.

Use the [left and right button] to move the cursor to the **【relay】**, use the [up and down keys] to select relay contact number, OFF stands for closure; R1 ~ 12 stands for the corresponding relay output.

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.

Set the time for the rely of output delay, Alarm return difference and Change in the alarm

## 9.2 Set The Delay\ Hysteresis\ Change Alarm Time

This section will introduce the setting method of global parameter for the relay.

Alarm		2010-6-16 10:54:58	
Channel	<input type="text" value="01"/>		
Relay Delay	<input type="text" value="0Sec"/>	Hysteresis	<input type="text" value="0.00"/>
I Alm Time	<input type="text" value="0Sec"/>	D Alm Time	<input type="text" value="0Sec"/>
Alarm	Type	AlarmValue	Relay
1	<input type="text" value="H"/>	<input type="text" value="16.00"/>	<input type="text" value="R01"/>
2	<input type="text" value="L"/>	<input type="text" value="0.0"/>	<input type="text" value="R00"/>
3	<input type="text" value="L"/>	<input type="text" value="0.0"/>	<input type="text" value="R00"/>
4	<input type="text" value="L"/>	<input type="text" value="0.0"/>	<input type="text" value="R00"/>
<input type="button" value="Exit"/>			

1. Time-delay of time relay: delay time of output: 0-10 / 20s/ 30s/ 1m/ 2m/ 5m/ 10m/ 20m/30m/60mseconds.
2. Alarm return difference: the value of alarm returns difference. It is only valid to H/L alarm.
3. Incremental alarm time: it is effective to I alarm with a scale of 1-32 seconds.
4. Alarm time reducing: it is effective to D alarm with a scale of 1-32 seconds.



## Chapter 10 Set the Display Configurations

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 Screen Brightness and the First Screen

This section describes the screen brightness and the setting method of first view and curve direction on the paper.

Display		2010-4-13 11:32:24	
Direction	Horizontal	Brightness	10
First View	ViewAll		
<hr/>			
Group		Channel	
Group1	1	01	
	2	02	
	3	03	
	4	04	
	5	05	
	6	06	
			Exit

Screen brightness: range 0 – 10.

Curve direction on the paper: horizontal, vertical.

First view: the first screen after the instrument starts.

## 10.2 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”.

The screenshot shows a 'Display' configuration screen with a blue header bar containing the title 'Display' and the timestamp '2010-4-13 11:32:24'. Below the header, there are three settings: 'Direction' set to 'Horizontal', 'Brightness' set to '10', and 'First View' set to 'ViewAll'. A horizontal line separates these settings from a table below. The table has two columns: 'Group' and 'Channel'. The 'Group' column has a dropdown menu currently showing 'Group1'. The 'Channel' column lists six channels, each with a dropdown menu showing a two-digit number from '01' to '06'. An 'Exit' button is located in the bottom right corner of the screen.

Group	Channel
Group1	01
	02
	03
	04
	05
	06

Use the [left and right button] to move the cursor to the **【group】**, use the [up and down keys] to choose serial number.

Use the [left button] to move the cursor to the **【channel】**, use the [up and down keys] to select open or close channel.

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 Configurations

### 11.1 Set the Channel Accumulation, the Initial Value and Magnification

This section describes the setting method of accumulative channel, the accumulative initial value, accumulative magnification, purging accumulation and settlement time.

Cumulative Initial value: initial value of accumulation begins to accumulate.

Cumulative Rate: According to the normal rate of a cumulative accumulation to multiply.

Purging accumulation: purging the accumulation of the current channel.

Precision: set the displayed precision for all the accumulative value of all channels reports.

Settlement time: From the setting settlement time to the next one, this period can be regarded as one-day channel accumulation after the reports starts accumulation function.

#### Operation:

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

Report		2010-4-13 11:32:24	
Precision	<input type="text" value="2"/>	Settle Time	<input type="text" value="00hour"/>
Shift Num	<input type="text" value="3"/>	Tag	
	1	<input type="text" value="A"/>	
	2	<input type="text" value="B"/>	
	3	<input type="text" value="C"/>	
		From	To
		<input type="text" value="00:30"/>	<input type="text" value="08:30"/>
		<input type="text" value="08:30"/>	<input type="text" value="16:30"/>
		<input type="text" value="16:30"/>	<input type="text" value="00:30"/>
Channel	<input type="text" value="01"/>	Enable	<input type="text" value="ON"/>
Initial	<input type="text" value="0.00"/>	Multiple	<input type="text" value="100.00"/>
		<input type="button" value="Clr Accu"/>	<input type="button" value="Exit"/>

Use the [left and right button] to move the cursor to **【Precision】**, and then use the [up and down keys] to adjust the precision, ranging from 0 to 2.

Use the [left and right button] to move the cursor to the **【settlement time】**. And then use the [up and down keys] to adjust the settlement time, ranging from 00 to 23:00

Use the [left and right button] to move the cursor to the **【channel】** ., use the [up and down keys] to select channel.

Use the [left and right button] to move the cursor to **【accumulation allowed】** , and then use the [up and down keys] to select to open or close the accumulative function.

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.

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 ~ 999999.00.

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 classes per day, 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”.

Report		2010-4-13 11:32:24	
Precision	<input type="text" value="2"/>	Settle Time	<input type="text" value="00hour"/>
Shift Num	<input type="text" value="3"/>	Tag	
	1	<input type="text" value="A"/>	<input type="text" value="00:30"/>
	2	<input type="text" value="B"/>	<input type="text" value="08:30"/>
	3	<input type="text" value="C"/>	<input type="text" value="16:30"/>
			<input type="text" value="08:30"/>
			<input type="text" value="16:30"/>
			<input type="text" value="00:30"/>
Channel	<input type="text" value="01"/>	Enable	<input type="text" value="ON"/>
Initial	<input type="text" value="0.00"/>	Multiple	<input type="text" value="100.00"/>
		<input type="button" value="Clr Accu"/>	<input type="button" value="Exit"/>

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.

Use the [left and right button] to move the cursor to the **【start time】**, use the [up and down keys] to adjust the time of shift number.

Use the [left and right button] to move the cursor to the **【display tag】** , use the [Enter] to adjust the display tag of shift report.

Confirming operation

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

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

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

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

## Chapter 12 Set Printing Configuration

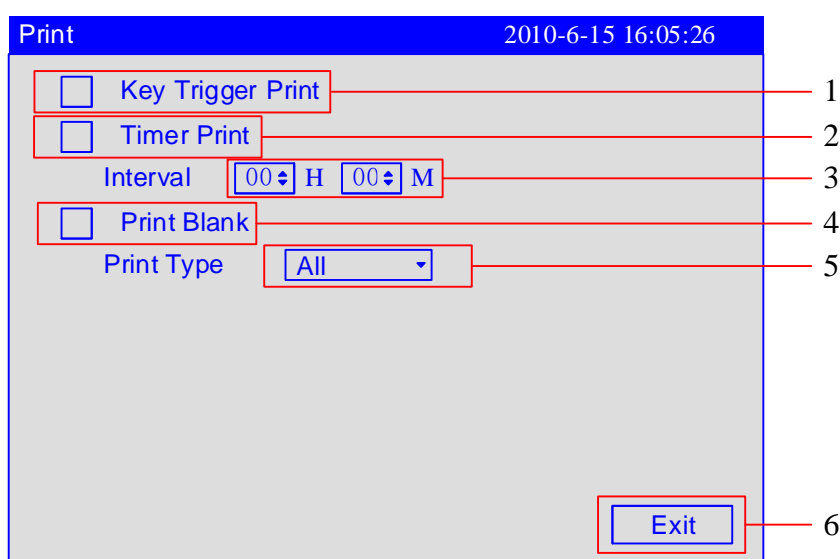
### 12.1 Set Printing Configuration

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

#### Operation:

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

Use the [left and right button] to move the cursor to choose printing functions, use the [up and down keys] to open or close button printing functions.



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

## Chapter 13 Set Communications Configuration

### 13.1 Set Device Address and the Order of Byte-Swapping

This section describes the setting method of Modbus device address and byte-swap.

#### Operation:

Communication		2015-8-16 10:49:40	
Address	<input type="text" value="001"/>	ByteSwap	<input type="text" value="1-2 3-4"/>
COM1			
BaudRate	<input type="text" value="115200"/>	Check	<input type="text" value="None"/>
COM2			
BaudRate	<input type="text" value="115200"/>	Check	<input type="text" value="None"/>
Ethernet			
IP Address	<input type="text" value="192.168.3.14"/>	Connected: 2	
Port	<input type="text" value="502"/>		
Mask	<input type="text" value="255.255.255.0"/>		
Gateway	<input type="text" value="192.168.3.1"/>		
Timeout	<input type="text" value="30sec"/>	<input type="button" value="Exit"/>	

#### Parameter:

1. Device address: MODBUS device address, ranging from 1 to 247.
2. Byte-Swap: In order to be suitable for ModbusRTU communication protocol, it provides byte-swapping functions.
3. 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.

## 13.2 Set Communication Baud Rate and Check

This section describes the setting method of serial communication baud rate and check.

### Operation:

Communication		2015-8-16 10:49:40	
Address	<input type="text" value="001"/>	ByteSwap	<input type="text" value="1-2 3-4"/>
COM1			
BaudRate	<input type="text" value="115200"/>	Check	<input type="text" value="None"/>
COM2			
BaudRate	<input type="text" value="115200"/>	Check	<input type="text" value="None"/>
Ethernet			
IP Address	<input type="text" value="192.168.3.14"/>	Connected: 2	
Port	<input type="text" value="502"/>		
Mask	<input type="text" value="255.255.255.0"/>		
Gateway	<input type="text" value="192.168.3.1"/>		
Timeout	<input type="text" value="30sec"/>	<input type="button" value="Exit"/>	

### Parameter:

1. Baud rate: 1200,2400,4800,9600,19200,38400,57600,115200. The default value is 115200.
2. Check: Serial communication check. Parity: no parity, odd parity, even parity. The default value is no check



### 13.3 Modbus-RTU protocol

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

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

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

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

For example:

Ask: 01 04 00 00 00 01 31 CA

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

Response: 01 04 02 00 64 B8 DB

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

## 13.4 Set Ethernet Configuration

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

### Operation:

Communication		2015-8-16 10:49:40	
Address	001	ByteSwap	1-2 3-4
COM1			
BaudRate	115200	Check	None
COM2			
BaudRate	115200	Check	None
Ethernet			
IP Address	192.168.3.14	Connected:	2
Port	502		
Mask	255.255.255.0		
Gateway	192.168.3.1		
Timeout	30sec		Exit

### Parameter:

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

**Port:** Software port number for Ethernet connects.

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

**Gateway :** The address of gateway.

**Timeout :** The connections retry intervals.

## 13.5 Modbus/TCP protocol

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

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

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

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

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

For example:

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

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

Response: 00 00 00 00 05 01 02 00 64

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

## 13.6 Register address

<b>Channel</b>	<b>Real (signed short)</b>	<b>Real (float)</b>	<b>Accumulation (unsigned long)</b>
1	30001	30101	30201
2	30002	30103	30203
3	30003	30105	30205
4	30004	30107	30207
5	30005	30109	30209
6	30006	30111	30211
7	30007	30113	30213
8	30008	30115	30215
9	30009	30117	30217
10	30010	30119	30219
11	30011	30121	30221
12	30012	30123	30223
13	30013	30125	30225
14	30014	30127	30227
15	30015	30129	30229
16	30016	30131	30231

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

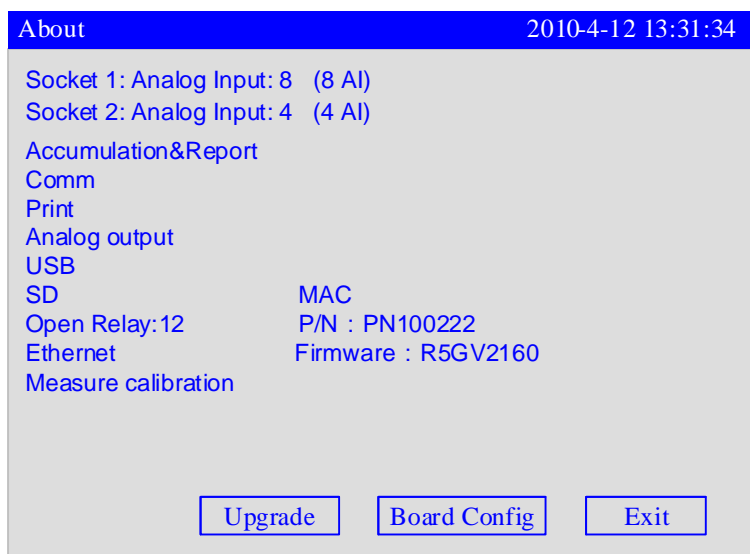
## Chapter 14 System Information and Upgrade

### 14.1 Check System Information

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

#### Operation:

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



#### Check AD Board:

Left side (Socket 1: Analog Input: 8) is the inherent information in AD, right side (8 AI) is the current AD board information, if there is any difference between them, this shows that AD board failure, please contact the manufacturer for maintenance.

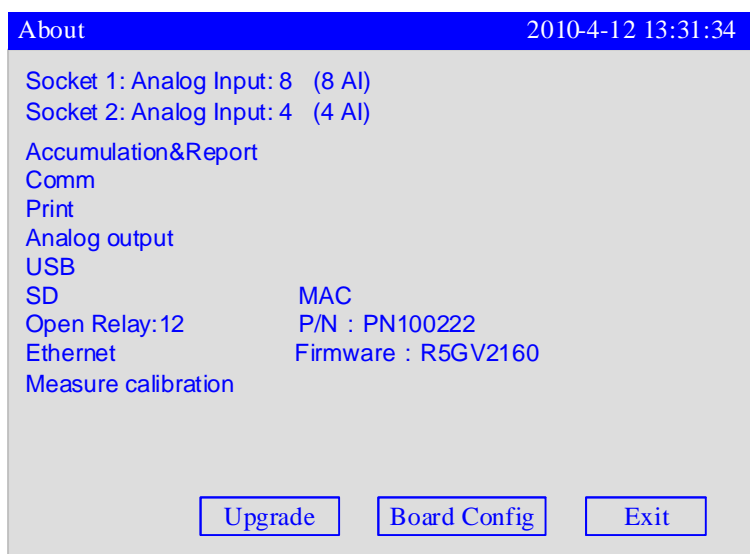
## 14.2 Upgrade

This section describes the program upgrade through U disk.

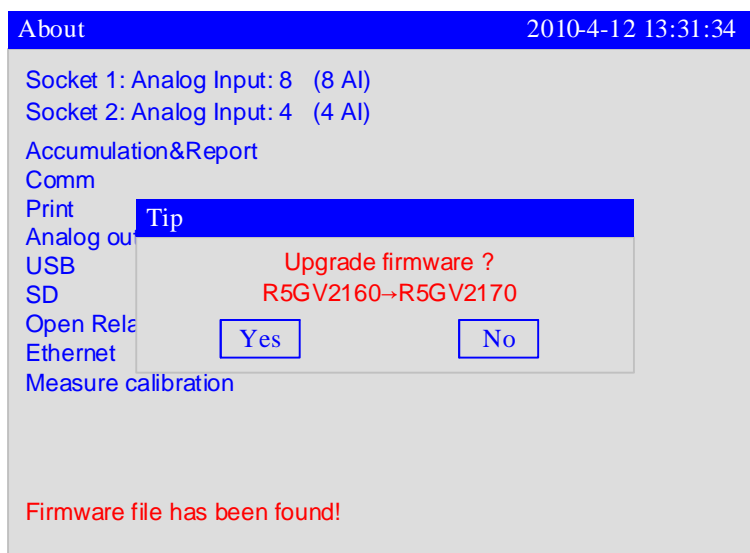
### Operation:

Put the program file (such as R5GV.img) provided by the manufacturer into the U disk, and insert the U disk into the USB socket of the instrument to be upgraded.

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



The red letter **【firmware file has been found!】** is displayed below, and a prompt window will pop up. After checking and confirming that the original firm and the upgraded firm are correct, select **【Yes】** .



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

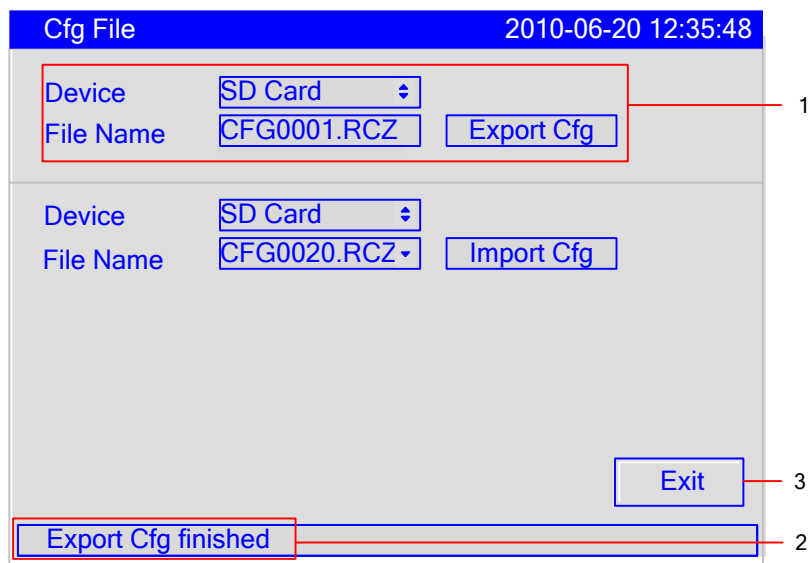
## Chapter 15 Import and Export Configuration File

### 15.1 Export Configuration File

This section describes Configuration file export function and operation methods. Configuration file export can export the current channel setup information, including input Configuration, recording Configuration, alarm Configuration, to the root directory of the external storage media.

#### Operation

Enter **【system Configuration】** , for the method to enter, please refer to the section 『 login Configuration 』 .



Use the [left and right button] to move the cursor to the **【Device】**, and then 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 then 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】** , and use the [Enter ] to export Configuration.

Show the condition of Configuration file export.

Use the [left and right button] to move the cursor to the **【Exit】** , and then use [Enter ] to exit the Configuration file screen.

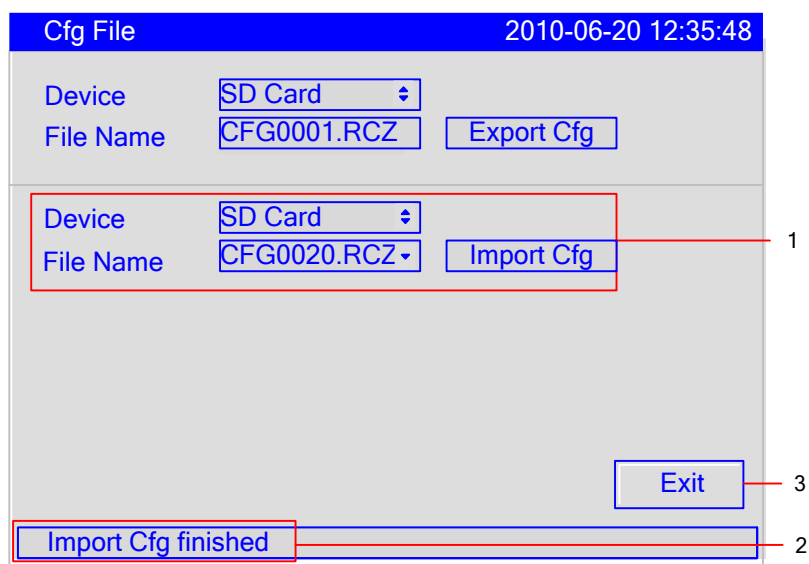
## 15.2 Import Configuration File

This section describes the significance of the Configuration file import and method of operation.

Import the Configuration file: To set multiple models of the same model and Configuration, you can only configure one of the instruments. First, you export Configuration file for this instrument , for Configuration file export, please see the section 『 Configuration file export 』 , and the remaining instruments only need to import the Configuration file , which simplifies the operation of multi-channel Configuration.

### Operation

Enter **【system Configuration】** , for the method to enter, please refer to the section 『 login Configuration 』 .



Use the [left and right button] to move the cursor to the **【Device】**, and then 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 then use the [up and down keys] to confirm the file name for importing; use the [left and right button] to move the cursor to the **【Import Configuration】** , and use the [Enter ] to import Configuration.

Show the condition of Configuration file import.

Use the [left and right button] to move the cursor to the **【Exit】** , and then use [Enter ] to exit the Configuration file screen.



## Chapter 16 Specifications

### 16.1 Signal Input and Alarm

#### Measurement input

Item	Specifications
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	-20.00mA ~ 20.00mA
	0-10mA	-10.00mA ~ 10.00mA
Voltage	1-5V	1.000V ~ 5.000V
	0-5V	-5.000V ~ 5.000V
	0-10V	-10.00V ~ 10.00V
	20mV	-20.00mV ~ 20.00mV
	100mV	-100.00mV ~ 100.00mV
Resistance	400Ω	0.0Ω ~ 400.0Ω
	175Ω	0.0Ω ~ 175.0Ω
Digital signal	FR	0Hz ~ 10000Hz
	FR.	0.0Hz~3000.0Hz
RTD	PT100	-200.0°C ~ 650.0°C
	PT100.	-50°C ~ 150.0°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 = 0.5mA (resistance, RTD)

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

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

## Alarm

Item	Specifications
The number of alarms	each channel has 4 alarm
alarm type	High high alarm type , high alarm, I alarm , D alarm
Alarm delay time	0-10s /20s/30s/1m/2m/5m/10m/20m/30m/60m
Alarm output	Alarm outputs to the internal relay Internal relay number: 8 Or 12( If the channel number is more than 12, it is 8, otherwise, it is 12) 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	5.6-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	6
the number of channels which can be allocated to each group	$\leq 6$
Display colors	256 kinds
Real-time trend	
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	display measured values with digital
Update Rate	1 second
Bar graph display	display measurement on the bar graph
Update Rate	1 second
ruler	0% ~ 100%
Historical curves show	display stored data in the memory
Timeline operation	can enlarge one times / 2 times / 4 times / 8 times / 16 times / 32 times
Alarm list display	display up to 256 alarm records

**Other displayed information**

Item	Specifications
channel-bit	7 Chinese characters or 15 letters(numbers)
Channel units	three Chinese characters 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 media	Back up the record data in the device
Media	U Disk, SD card
Capacity	Up to 32GB
File format	FAT32
File Name	The default format :DAT+ "number" ( can edit )
Report Name	The default format : 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: 12(input channel $\leq 12$ ) 8(input channel $> 12$ ) Normally closed contact: 6(input channel $\leq 12$ )
Relay contacts	250VAC(50/60Hz)/3A, 250VDC/3A((load resistance))
Output Type	normally open or normally closed
Relay Operation	OR operation

### RS232C/RS485

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

**Ethernet**

Item	Specifications
Interface	RJ45
Connection	10M
Protocols	Modbus-TCP

**24VDC Power Distribution**

Item	Specifications
Loop	4
Output voltage	22VDC ~ 25VDC(rated output current)
Maximum output current	65mADC(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
Power Supply	5V $\pm$ 10%, 100mA
devices can be connected	U disk

**SD card function**

Item	Specification
SD card port	Compatible with standard SD protocol( NOT SDHC)
Number of ports	1
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)
Allowable panel thickness	1 ~ 10mm
Material	Panels and Terminal Material: ABS plastic Shell: Aluminum alloy
Dimensions	144(W)×144(H)×220(D)(D : the length from the installation panel to terminal)
Weight	About 2.6Kg(not including accessories)

### Standard operating conditions

Item	Specifications
Supply power	220VAC
Power Frequency	50Hz
Ambient temperature	0°C ~ 50°C
Environment Humidity	20% ~ 85%RH( non-condensing)
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 power frequency	47-63Hz
Power consumption	≤20W(including the matching function)

### Isolation

Item	Specifications
Resistance voltage	measurement input terminals: : 400V between protective ground and measured terminal: 1000V
Grounding resistance	Grounding resistance ≤ 10Ω

### Transportation and storage condition

Item	Specifications
temperature	-10°C ~ 60°C
humidity	0% ~ 95%(non-condensing)
shake-proof	10~55Hz, 10m/S <sup>2</sup> , 2 hours
Impact-proof	Working:30/S <sup>2</sup> (3g), Transporting: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%	1M
1-5V	1.000-5.000	±0.2%	1M
0-10V	0.000-10.000	±0.2%	1M
0-20mV	0.00-20.00	±0.2%	10M
0-100mV	0.00-100.00	±0.2%	10M
400ohm	0.0-400.0	±0.2%	---
175ohm	0.0-175.0	±0.2%	---
Fr	0-10000	±1Hz	---
Fr.	0.0-3000.0	±0.1Hz	---
S	-50-1768	±2°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	---
Pt100.	-50.0-150.0	±0.2°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 board**

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



---

**Analog output board**


---

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**

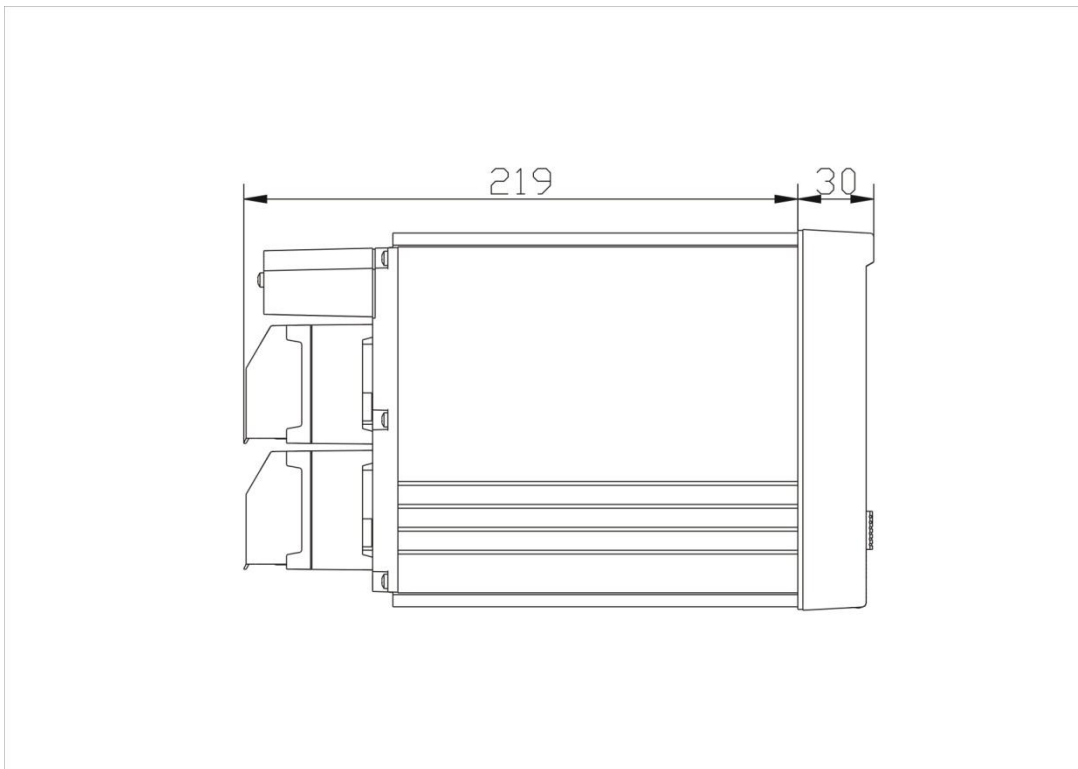
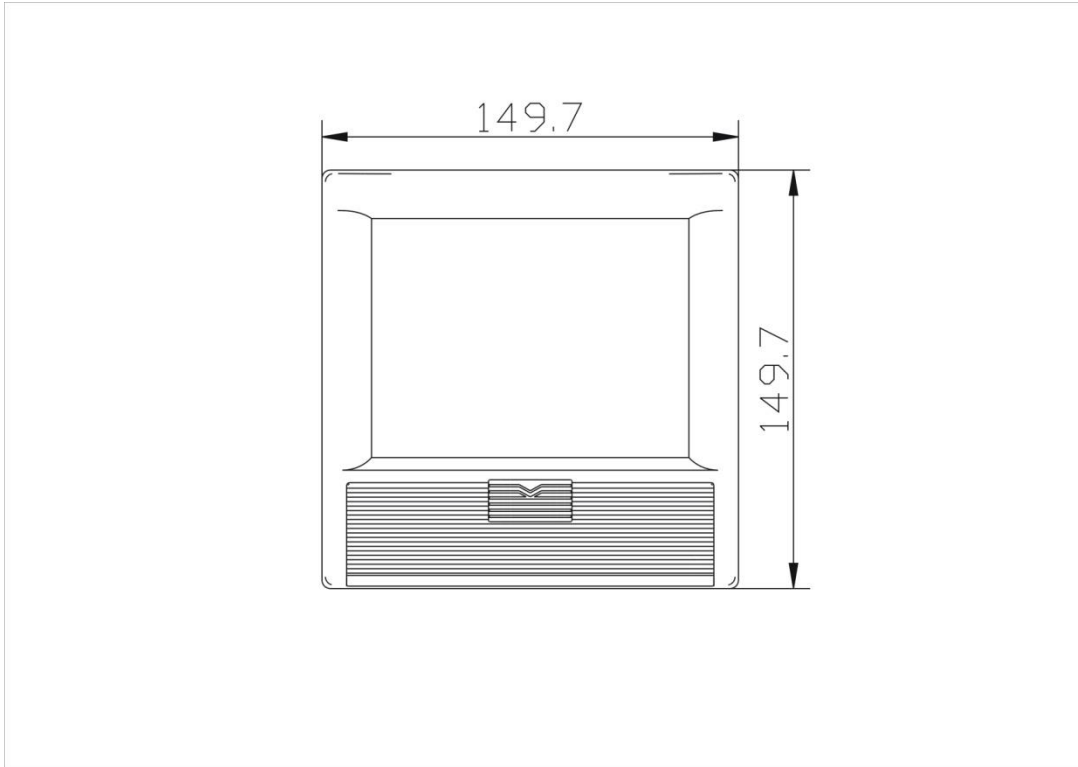

---

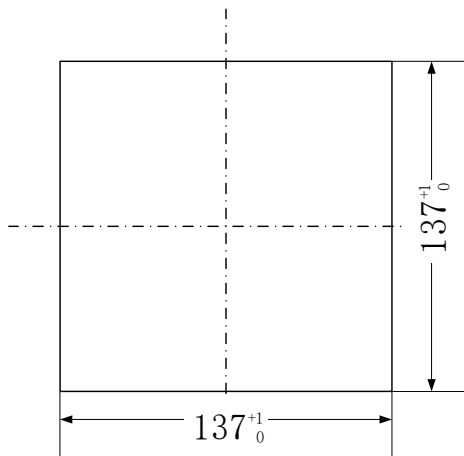
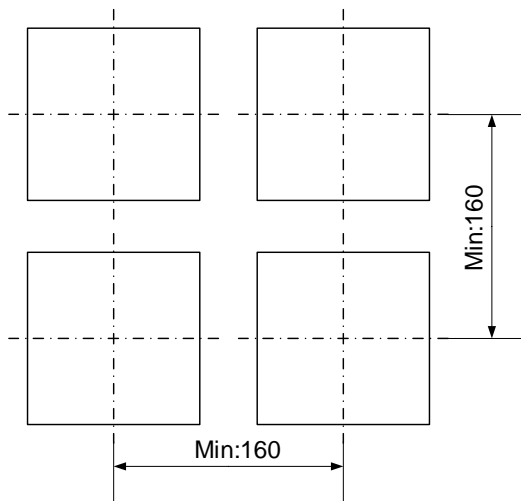
Item	Specification
Data storage limit	About 10 year
Safety agency approval	EN61010-1:2001
Electromagnetic compatibility	EN61326-1:2006 EN61000-3-2:2006 EN61000-3-3:2008
Protection grade	Front panel IP50, complete machine:IP40

---

## 16.7 External Dimensions

Unit: mm



**Dimensions of Instrument installation****Unit: mm****Hole size of Instrument****Hole size of container**





---

---