SAFETY PRECAUTIONS

◆ The instrument apply to general industrial occasions, but keep protect the device separately when you has the special using purpose. Do not operate in explosive atmosphere but keep vantilate on the installation site.

◆ Use Rated voltage of the power supply, correct wiring, Proper grounding, do not touch the terminals on back of the device to keep of electric shock.

◆ In order to be safty, keep out of charged when installation, maintenace and remove.

◆ It need take shielding steps when the device is close to the occassions of Mains power, high electric field, high magnetic fields and Ac contactor .

◆ In order to avoid measuring error when the sensor is thermocouple pls use the compensating wire correspondingly, when the sensor is thermal resistance need use three sane copper conductor and the resistance is less than 10Ω.

◆ Use the soft cloth to clean the instrument but keep out of organic solvents such as alcohol and petro; Turn of the power, stop using when the instrument is in water.

◆ In order to keep machine well, regular maintenance and maintenance is needed

◆ When open the cartons the instrument is broken by transportaion pls contact with the manufaturer.

◆ When open the cartons pls check the packing list carefully as follows:

No.	Name	Unit	QTY	NOTE
1	Paperless recorder	pcs	1	
2	User Manual	book	1	
3	Mounting bracket (with screws)	pcs	2	
4	Application	set	1	
5	Standard Software（CD）	set	1	
6	U disk	pcs		optional
7	RS232C lines	pcs		optional
8	RS232C/485 convert modula	pcs		optional
9	RS232C/CAN convert modula	pcs		optional
10	Micro printer（accessory）	pcs		optional

CONTENTS

CHAPTER 1 TECHNICAL INDEX

- **SCREEN**
  SCREEN:128*64 dot matrix blue LCD screen
  ACCURACY: REAL TIME DISPLAY:±0.2% F.S.
  RECALL ACCURACY:±0.2% F.S.
  Note: Thermocouple should minus the cold end error

- **PROCESSOR**
  Using high-performance ARM Cortex-M3 32 bit RISC cores
  can realize multi-channel collection, record, display and alarm
  at same time.

- **MEMORY MODULA**
  Use large parallel capacity NAND FLASH MEMORY chip to
  storage history data, using serial FRAM chip to storage key
  system configuration parameters.

- **INPUT FUNCTION**
  INPUT SPECIFICATIONS: Isolate universal input, support
  Max 4 channel analog input.
  INPUT VOLTAGE:0-5V、1-5V、0-20mV、0-100mV
  CURRENT INPUT:0-10mA、4-20mA（0-20mA Noted when
  place order）
  INPUT RESISTANCE: Res
  INPUT FREQUENCY:FREQENCY SIGNAL（PI）（frenquency
  range：0.5-5000HZ，The other can be customsized）
  THERMAL RESISTANCE:PT100、Cu50、G53、Cu100、BA1、
  BA2（require three balance wire resistance, LEAD
  RESISTANCE<10Ω）
  THERMOCOUPLE:S、B、K、T、R、E、N、J

RADIATION PYROMETER:F1、F2
RHENIUM:WRe3-25、WRe5-26
Note: Other signal input （such as switch value input（DI））
or index number（such as PT1000）need noted when place
order.

- **Out put function**
  POWER DISTRIBUTION: Transmitter Concentration
  distribution +24VDC，standard distribution ＜30mA（MAX load
  capacity can be customized）,Supports a variety of
  specifications and concentration distribution（such as 12VDC、
  5VDC）
  ANALOG OUTPUT： Max support 2 channel 4-20mA standar
  current anolog output，load capacity 750Ω（max），convenient
  for collection of indicating instrument or DCS/PLC，realize the
  long signal transmitter
  OUTPUT OF RELY ALARM: Max support 4 channel rely alarm
  output,contact capacity 3A@220VAC/1A@30VDC,Can be
  configured on the High High Limit/ High Limit/Low Limit/Low
  Low Limit alarm

- **COMMUNICATION PRINTER**
  COMMUNICATION INTERFACE:RS232C or RS485，support
  Modbus RTU protocol，baud rate----（1200、2400、9600、19200、
  38400、57600bps）
  PRINT INTERFACE:RS232C contact with the micro printer
  directly， baud rate ----1200bps

- **RECORDING FUNCTION**
  RECORDING CAPACITY:64/128/192/248MB
  （FLASH capacity can choose）
  RECORDER INTERVAL:1sec to 240secs，divided into 11
  levels：1s/2s/4s/8s/12s/24s/36s/60s/120s/180s/240s can be

choosed

TIME STORAGE LENGTH: The length of time data storage is related to the Flash capacity. Input point, recorder interval, thecomputation formulais as follows: (THE NUMERICAL UNITS to be consistent with the formula):

$$TIME\ STRORAGE\ LENGTH = \frac{FLASH\ CAPACITY(MB) \times 1024 \times 1024 \times INTERVAL(SEC)}{CHANNELS \times 16 \times 24 \times 3600}(DAY)$$

■ DATA BACKUP

U DISK: Various data can be saved to the U disk. The capacity is from 256MB to 32GB

■ POWER SUPPLY

POWER: 220VAC、50HZ.Support 24VDC(22VDC-28VDC)powe supply、support 12VDC (11.2VDC-16VDC) power supply

NOTE: DC POWER SUPPORT NEED DECLARE WHEN PLACE ORDER

■ PROTECTION FUNCTION

POWER OFF PROTECTION:internal memory protect parameters and historical data forever even if power off.

CLOCK PROTECTION: Integrated hardware clock, run accurately when power off

■ ERROR PRECESION

THERMOCOUPLE CJC ERROR:±2℃

CLOCK ERROR: ±2 secs/day

■ WORKING ENVIRONMENT

AMBIENT TEMPERATURE:0～50℃ (avoid direct sun light)
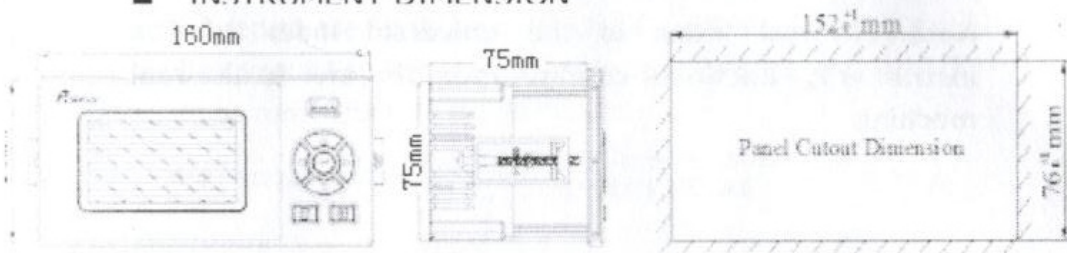
AMBIENT HUMIDITY:0～85%R.H(non-condensing)

■ NET WEIGHT

WEIGHT: Approx 1.0 Kg

Note:Technical index is the universal index of the instrument, Functional configuration pls refer to the real machine

CHANPTER 2 INSTALLATION AND WIRING

■ INSTRUMENT DIMENSION

160mm
75mm
75mm
152±1 mm
76±1 mm
Panel Cutout Dimension

■ TERMINAL CONNECTION （REFER TO THE OBJECT）

| | 1 | 2 | 3 |
| | L/+ | N/- | ⏚ |

4R	3R	2R	1R	2E	1E	4B	3B	2B	1B
4R	3R	2R	1R	2F	1F	4C	3C	2C	1C
A+	B-	G		P+	P-	4D	3D	2D	1D

Figure 2-2

■ AC INPUT POWER WIRING

AC-L AC-N ⏚   24V~ 24V~ ⏚   12V+ 12V+ ⏚

Phase line terminal
Zero line terminal
Protective earth terminal
24VDC~ terminal
24VDC~ terminal
Protective earth terminal
12VDC- terminal
12VDC~ terminal
Protective earth terminal

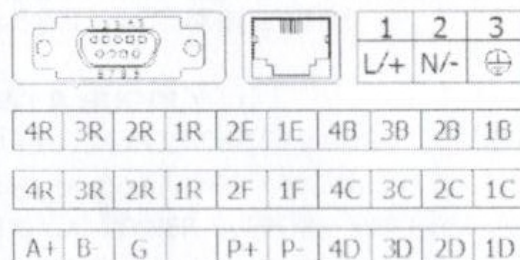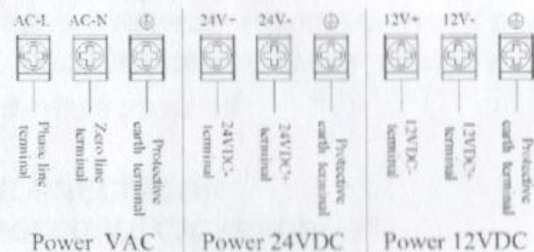Power VAC   Power 24VDC   Power 12VDC

Figure 2-3

Note: The supply power of the Engineering field must in the limit of the withstand voltage of the instrument.
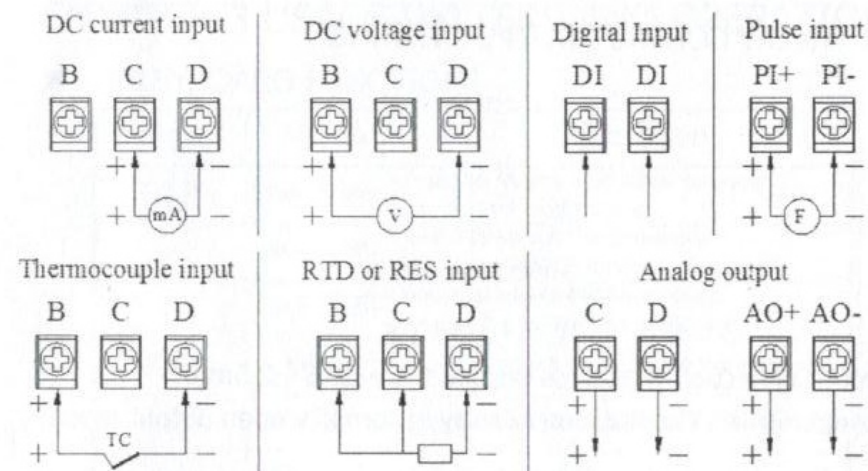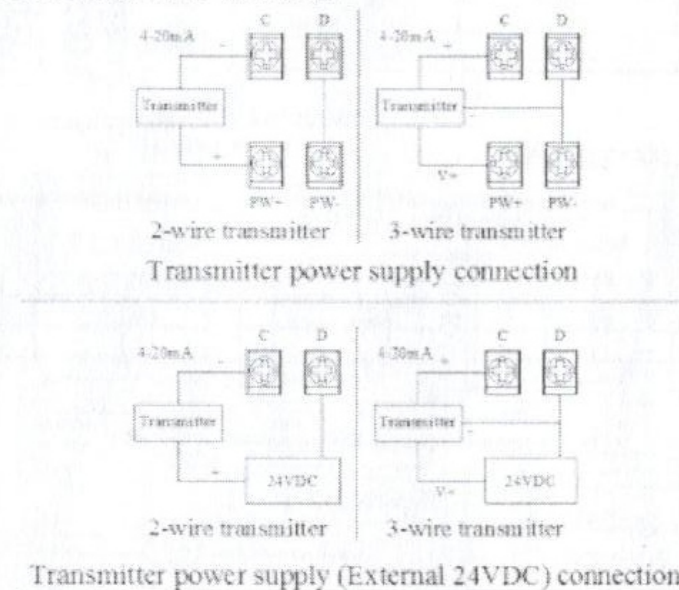
■ INPUT/OUTPUT SIGNAL WIRING

DC current input   DC voltage input   Digital Input   Pulse input

B   C   D   B   C   D   DI   DI   PI+   PI-

+   +   +   +   +   +
+ (mA)   + (V)   + (F)

Thermocouple input   RTD or RES input   Analog output

B   C   D   B   C   D   C   D   AO+ AO-

+   -   +   -   +   -   +   -
+ TC -   +   -   +   -   +   -

Figure 2-4

■ TRANSMITTER WIRING

4-20mA   C   D   4-20mA   C   D
Transmitter   Transmitter
                PW- PW-   V-   PW+ PW-
2-wire transmitter   3-wire transmitter

Transmitter power supply connection

4-20mA   C   D   4-20mA   C   D
Transmitter   Transmitter
       24VDC   V-   24VDC
2-wire transmitter   3-wire transmitter

Transmitter power supply (External 24VDC) connection

Figure 2-5

RELAY CONTACT OUTPUT WIRING

Normally Open

xR   xR

Relay output

Figure 2-6

Note:Connection wire cross-sectional area:0.5~2.5mm^2,

torque:50Nm. The instrument relay is normally open output mode.
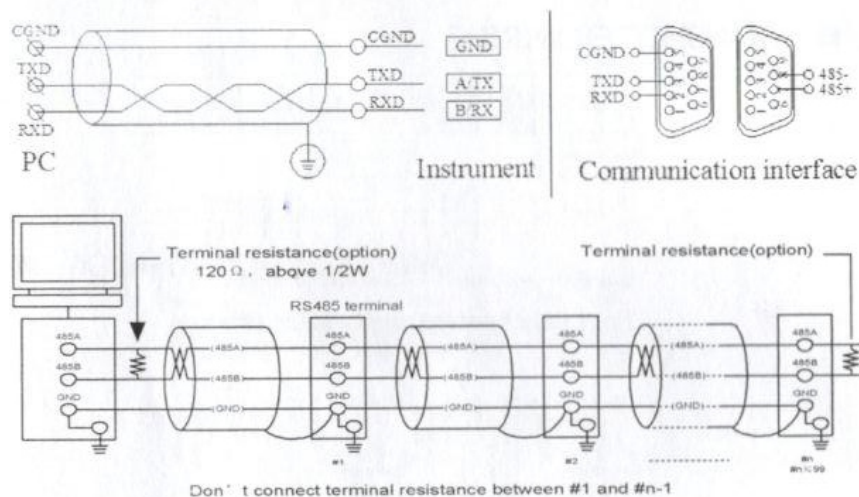
COMMUNICATION INTERFACE DEFINITION AND WIRING

CGND — CGND [GND]
TXD — TXD [A/TX]
RXD — RXD [B/RX]
PC   Instrument   Communication interface

CGND —
TXD —
RXD —   485-
               485+

Terminal resistance(option)
120Ω, above 1/2W

Terminal resistance(option)

RS485 terminal

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

Figure 2-7

CHAPTER 3 USAGE PATTERS AND OPERATION

〖KEYBOARD FUNCTION〗

| Sign	Name	Description
⊞	Key Menu	Used to switch operation screens or decimal places, etc.
◀	Key Left	Used to switch the channel or move the cursor forward, etc.
▶	Key Right	Used to switch the channel or move the cursor backward, etc.
▲	Key Up	Used to switch or increase the value, etc.
▼	Key Down	Used to switch or decrease the value, etc.
↵	Key Enter	Used to activate the input box
⊞ ⊞	Key Combination	Used to switch from operation mode to setting mode（Pressing for 1 second）

Figure 3-1

〖RUN MODE〗
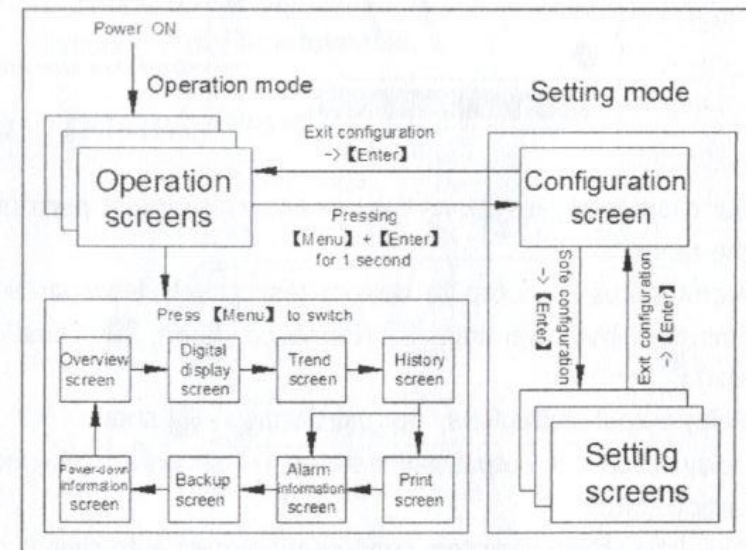
Figure 3-2

■ 〖OVERVIEW SCREEN〗

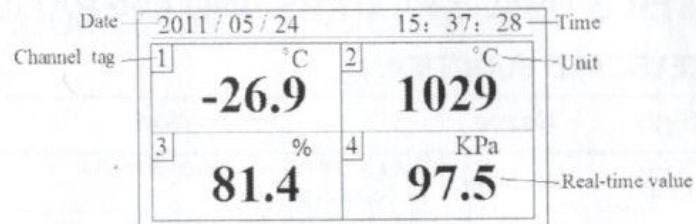Figure 3-3

- Real-time value:display the engineering data of the channel engineering .
- Unit:display the engineering unit,can free configuration.

■ 〖DIGITAL DISPLAY〗

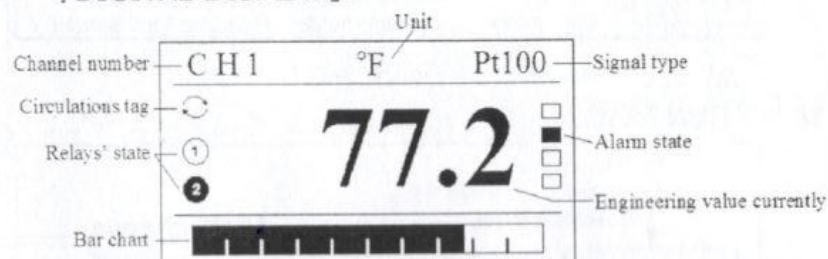Figure 3-4

- Bar chart:filled area shows the present measrement percent of the range.
- Alarm status:From top to bottom respectively is upper limit/ limit /low limit/lower limit, □ Normal condition, ■ Transfinite alarm
- Relay output status:Relay out put dispaly, ❷ shows k2 relay action is in output alarm status, ① shows K1 relay no action status.
- Circulation state:in system configuration open auto switch , means switching cycle each channel's digital screen, Switching

interval is adjustable; No auto switch, no display.
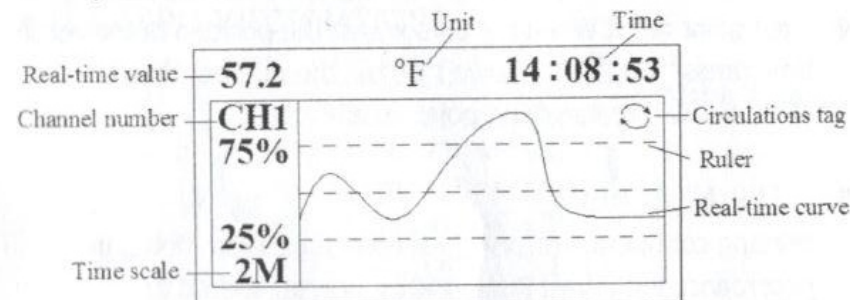
■ 〖CURRENT TREND〗

Figure 3-5

- Time scale:2M indicate the 2mins curve-segment.
- Real-time curve:Measure channel/computation data is correspondingly to the left end of the curve.
- Ruler:The weight scale of the screen curve, is correspondingly to the left screen percentage of the current screen and the component can be adjustable.
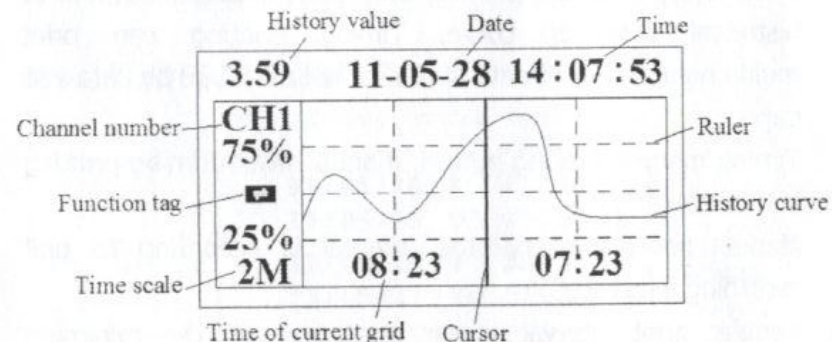
■ 〖HISTROY TREND〗

Figure 3-6

♦ Function tag:The present recall position,when the cursor is on ⇌,press 【Enter】 hidden/display cursors;press 【Up】 or 【Down】 realize continuous and rapid recall history curve.

♦ Fixed point recall:When the cursor is at the position of the recall time,press 【Up】 or 【Down】 adjust the number then press 【Enter】 can realize fixed point recall.

■ 『PRINT SCREEN』

Printing configuration:[print] for communication mode, in accordance with the 『RUN MODE』 operating switch:

BEG 11-05-28 18:55:03	Timerprint Yes
END 11-05-28 19:55:03	Interval 1 **Min**
Chnl **01** Interval **01**	Chnl **01-04**
Type **Data** Timerprint	ManualPrt Printing

ManualPrint   Timerprint

Figure 3-7

♦ Begin/end time:Begin time< end time< clock time.

♦ Print/stop: manual start/stop button.

♦ Channel/type:manual printing only print a single channel of historical data or curve, Timing printing can print multi-channel current data at the same time. Type be data and curve.

♦ Timing/manual printing button: manual switch/timing printing link button.

♦ Manual printing interval:the interval is according to unit recording interval.

♦ Regular print interval:regular print interval, the minimum interval of 1 min.

♦ Timed open print button:[open] when open, auto printing

after opening,no manual.

■ 『ALARM INFORMATION』

Index	Alarm time	Undo Alarm time	Alarm types
03	05/28 19:55:03	HH	
	05/28 20:27:49	CH 4	
04	05/28 20:38:25	H I	
	05/28 21:41:36	CH 3	Scrollbar
05	05/28 23:08:11	LO	
	05/28 23:12:01	CH 1	Channel number

(vertical label: Alarm INF.)

Figure 3-8

♦ Alarm index:Max keep 24 groups alarm information,singal channel can show 3 group information at most

♦ Alarm/Undo alarm time:Line first is alarm time, second line is Undo alarm time, no Undo alarm time is --/--   --:--:--

♦ Alarm types: High High Limit（HH）、High Limit（HI）、Low Limit （LO）、Low Low Limit（LL）

♦ Channel number:Current alarm information channel number

♦ Scrollbar:Current page

■ 『POWER INFORMATION』

Index	Power-down time	Power-up time	
03	11/05/26 09:42:46		
	11/05/26 09:45:07		
04	11/05/26 17:38:25		
	11/05/27 08:51:36		Scrollbar
05	11/05/27 16:17:11		
	11/05/27 16:29:51		

(vertical label: Power INF.)

Figure 3-9

- Power-down index:Keep most 24 power-down/up information
- Power-down/up time:First line is power-down time, second line is power-up time
- Scrollbar:Current page

■ 「BACKUP HISTORY DATA」

```
Chnl 01 - 04        On line
BEG 11 - 11 - 03   10 : 15 : 03
END 11 - 11 - 03   13 : 17 : 48
File  1103125.BIN
▮▮▮▮▮▮▮▮▮▮▮       Backup
```

Figure 3-10

- Equipment:Show mode of U disk,on line,off line,fault state,can not detect U disk[off line],error in the back processing[fault]
- Channel:The number of backup channel. 01-01 indicate backup 1 channel. 01-04 indicate 1-4 channel need backup
- Begin: Need backup the start time of historical data
- End:Need backup the end time of historical data
- File:backup file name
- Progress bar: Show the current progress of the backup process
- Backup/reset/complete:Start, reset, backup complelet status button
- When the cursor is in the [BEG]or [END]Settings box, press 【Enter】 into quickly jump
- Such as an error in the way or need to copy again,put the cursor on [backup]button,press 【Up】 or 【Down】 choose to be[reset],press 【Enter】 then can into detecting the storage

device again, when backup finish,[backup] or [reset] button come to be [complete],if need continue copy put the cursor on the [complete] button and press 【Up】 or 【Down】 to choose [backup] and press 【Enter】

CHAPTER 4 CONFIGURATION AND ASISTING OPERATION
■ 「CONFIGURATION」AND 「SYSTEM CONFIGURATION」

```
Password:00 00 00*        Time 11 - 05 - 28  19 : 55 : 03
                          Password  00 00 00
System      Input         Interval 240 S   Comset
                          Switch 00 S   SYS-MAINT
Output      Exit          CJC    28 °C          Exit
```

Configuration screen   System configuration

Figure 4-1

- Hold on 【Menu】 and 【out】 1 sec later,enter in 「configuration」 screen
- 「Configuration」 innitial password is [00 00 00],after enter in the correct password press【Enter】into classification menu,'*' no disappear indicate erro password or no press 【Enter】 in confirm
- Time setting:System date and time set
- User password:User password authority set
- Record interval:Can be 1/2/4/8/12/24/36/60/120/180/240s.The longer the record interval is, the longer of record time, or the short the record interval is, the short of the record time, Usual, the rapid change of the measured signal, need choose the short record interval. Or opposite,when the measured signal changes slowly, can choose the long record interval.

- Auto switch:Use to auto switch current curve digital screen channel,start with 0S,indicate not auto switch,can adjust the numbers on secondary screen rapidly
- Cold junction compensation (CJC):has setting and external two mode. When cursor at [CJC], press【Enter】into「Cold setting」configuration to choose the two mode,[setting]the code data under setting can be adjustable,[external]the cold data mode can catch by atuo,system is under external mode
- System maintenance:Use to default Settings/ clear alarm information/power information and so on

■ 「COMMUNICATION CONFIGURATION」

In「system configuration」the [communication configuration] can set the different on line mode:

Mode PC Addr 001	Mode Print Addr 001
Stopbits 2 Parity Odd	
Baudrate 38400	Baudrate 1200
Exit	Exit

Figure 4-2

- Address:Communication address is a use of idetify in the network,it is the identification of the instrument in network; pc software use this to acess the instrument; in a same communication address the ip address can be setted in 1-255, can not be repeat
- Stopbits and parity:need the same setting of the pc software, defualt setting
- Baud rate:PC mode baud rate can be changed（must the same to pc software）,Printer mode baud rate can't be changed

■ 「INPUT CONFIGURATION」

Chnl 01	Type Pt100
Alarm	Unit °C
Range -99.9 ~ 850.0	
Adj. 0.0	Filter 0 S
Copy Paste	Exit

Figure 4-3.1

- Channel
  According to customer demand, 4 is the most
- Type
  It support several type message, and the analog signal support for universal input, change different signal types without change module ,only need change the terminal connection and set the right signal type. Instrument support a variety of signal types such as :0~20mV、0~100mV、0~5V、1~5V、0~10mA、0~20mA、4~20mA、Pt100、Cu50、Cu100、G53、BA1、BA2、B、E、N、R、J、K、S、T、WRe3-25、WRe5-26、F1、F2、PI、Res（resistance）
- Unit
  The instrument has the following engineering unit for choose: m3/h、m3/min、m3/s、L/h、L/min、L/s、t/h、t/min、t/s、kg/h、、kg/min、kg/s、°C、Pa、kPa、MPa、kgf/cm^2、Bar、mmH_2O、mmHg、%、ppm、r/min、ph、mm、Hz、kHz、mA、A、kA、mV、V、kV、VA、kVA、W、kW、MW、J、kJ、kg、kWh and so on
- Measurement range
  User-defined range scope, the high limit and low limit, can

configurate freely. Press【Menu】to adjust the decimal digits of measurement range , press【Enter】into「secondary screen」to rapid change the parameters

◆ Alarm setting

```
HH: 850    Relay: None
H I: 735    Relay:  02
LO: 46     Relay:  01
LL: -99.9  Relay:  02
Zone: 10.0%         Exit
```

Figure 4-3.2

①**Alarm threshold:**HH、HI、LO、LL is refer to high high limit, high limit, low limit, low low limit alarm, the value under is correspondingly to the alarm shreshold, when actual value bigger than correspondingly limits, differentcial and diference , can appear or eliminate alarm signal.

②**Alarm contactor:**relay serial,such as contactor 01 is No.1 relay.When value of signal out of setting, corresponding contactor will have an action, close contactor. Choose "No"indicate no matter signal value over or not, the relay keey no action, still in alarm list has alarm data.

③**Alarm differntcial:**alarm differentcial is to avoid instrument repeat alarm at alarm edge, such as range at 0~100, upper alarm dot is80、lower alarm dot is 20, alarm difference is 5.0%, when happen high alarm, the range of instrument is less 80-100*5%=75, then cancel the alarm this time, the same, when happen lower alarm, the data range at 20+100*5%=25, then cancell the alarm this time.

◆ Adjust

Allow the user adjust the deviation value, value =

measurement value +adjustable value, normally , set the adjustable value at 0

◆ Filter

Filtering time constant setting, Filter setting method:

$$Show\ value = \frac{Last\ value \times Input\ filter + Current\ value}{Input\ filter + 1}$$

◆ Copy and paste function

If the setting of each channel is the same, after one channel setting press cursor to [copy]、press enter, to copy next setting, press cursor to "channel" setting box, to change the channel, then press cursor to [paste],press enter can copy the function setting of the last into every setting box

■ 「OUTPUT CONFIGURAION」

```
Chnl 04       Type AO
Action   Reverse
Range  0.0  ～100.0
Source  CH3
                    Exit
```

Figure 4-4

◆ **Action**：Under direct of AO【Analog Output】,Transmitting range high limit to the output 20mA, Transmitting range low limit of output 4 mA：Under reverse of AO, Transmitting range high limit of output 4 mA,Transmitting range low limit of output 20mA.

◆ **Signal source:**setting the transmitting output signal source channel, CH3 is the third channel.

- 20 -

- 21 -

configurate freely. Press[Menu] to adjust decimal digits of measurement range, press[Enter] into[secondary screen] to rapid change the parameters

◆ Alarm setting

```
HH:  850    Relay: None
H I:  735    Relay:  02
LO:  46     Relay:  01
LL:  -99.9  Relay:  02
Zone: 10.0%         Exit
```

Figure 4-3.2

①**Alarm threshold:**HH、HI、LO、LL is refer to high high limit, high limit, low limit, low low limit alarm, the value under is correspondingly to the alarm shreshold, when actual value bigger than correspondingly limits, differentcial and diference , can appear or eliminate alarm signal.

②**Alarm contactor:**relay serial,such as contactor 01 is No.1 relay.When value of signal out of setting, corresponding contactor will have an action, close contactor. Choose "No"indicate no matter signal value over or not, the relay keey no action, still in alarm list has alarm data.

③**Alarm differntcial:**alarm differentcial is to avoid instrument repeat alarm at alarm edge, such as range at 0~100, upper alarm dot is80, lower alarm dot is 20, alarm difference is 5.0%, when happen high alarm, the range of instrument is less 80-100*5%=75, then cancel the alarm this time, the same, when happen lower alarm, the data range at 20+100*5%=25, then cancell the alarm this time.

◆ Adjust

Allow the user adjust the deviation value, value =

measurement value +adjustable value, normally , set the adjustable value at 0

◆ Filter

Filtering time constant setting, Filter setting method:

$$Show\ value = \frac{Last\ value \times Input\ filter + Current\ value}{Input\ filter + 1}$$

◆ Copy and paste function

If the setting of each channel is the same, after one channel setting press cursor to [copy]，press enter, to copy next setting, press cursor to "channel" setting box, to change the channel, then press cursor to [paste],press enter can copy the function setting of the last into every setting box

■ 「OUTPUT CONFIGURAION」

```
Chnl  04        Type  AO
Action  Reverse
Range  0.0   ~100.0
Source  CH3
                    Exit
```

Figure 4-4

◆ **Action:** Under direct of AO【Analog Output】 ,Transmitting range high limit to the output 20mA, Transmitting range low limit of output 4 mA; Under reverse of AO, Transmitting range high limit of output 4 mA,Transmitting range low limit of output 20mA.

◆ **Signal source:**setting the transmitting output signal source channel, CH3 is the third channel.

■ **[SECONDARY SCREEN]**

5,873
Range:0.000~9.999
Enter   Cancel

5186
Error! Out of range
Enter   Cancel

Figure 4~5

Secondary screen is mainly use to auto switch setting.Cold, junction compensation setting. Alarm limit setting, measurement, range limit setting and so on. Enter into secondary screen can, quickly adjust multibit vlue, once the value is beyond the scope, the system will note you it is out of parameter range, key operate, please refer to [keyboard function]