Rev3 . 2010

SWP - ASR100

Series Paperless Chart Recorder

- 32Bits Built-in high performance ARM cpu
- Universal isolated 16 types multiple inputs
- Diagram display according to Sensor type
- Aluminum casing, EMC anti-interference
- RS-232 / RS-485 Com ports at 115200BPS
- Multi-Languages are available
- USB 2.0 data download is supporting
- Flexible application software
- User customization function is supporting

User Operating Manual

ISO 9001:2000 :03010010052ROM

CHARM FAITH AUTOSYSTEM CO., LTD

✧ *Swp* ® is CharmFaith Autosystem trade mark.

✧ Charm Faith instrument copyright.

Shipping detail

Dear customer,

Appreciate you use Charm Faith SWP-ASR100 series paperless recorder. Please check the shipping items included. Any issue, please contact our service center or distributor. We will great to provide our best service!

Shipping items	
SWP-ASR100 paperless recorder	1
SWP-ASR100 user manual	1
Installation fixing	2
Power filter modutor	1
Product certificate card	1
Product warranty card	1

Overview

In order to correctly use SWP-ASR series, please read carefully this operating manual. For safety reason, grounding is very importance. After finishing the installation, confirmed that power lines have connected correctly otherwise the instrument outer covering might be with approximately 110 V. Communication ports connection should be under power off condition.

Please do not disassemble the instrument. Contact company service center or the local business agent if the instrument is breakdown. Please maintain the instrument surface clean with soft dry cloth. The gasoline or alcohol and any organic solvent are not allowed for surface cleaning.

Index

Chart Recorder

1.1 Features

1.1.1 Input & Output

Input signal	Analog Input	T.C: B、S、K、E、T、J、W
		RTD: PT100、CU50
		DC: 0-5V, 1-5V, 0-100mV, 0-20mV, 4-20mA
	Pulse Input	Rectangular, sine or triangular wave:
		Amplidute Range>= 4V, frequency 0 - 15KHz
Output Signal	Analog output	DC Current: 0-10mA, 4-20mA
		DC Voltage: 0-5V, 1-5V
	Relay contact rating	Relay: 220V/3A or DC 24V/5A
		SCR: 400V/0.5A
		SSR: 6-9V/0.05A
	Power Output	DC 24V/30mA

1.1.2 Performance

Accuracy	0.5%FS±1digit or 0.2%FS±1digit (ignored level: 0-25.5%FS)
Range	-9999 - 99999
Sampling Period	0.5 second
Interrecord Time	1 second - 4 minutes
Display mode	High resolution, brightness adjustable, wide view angle and bright TFT color LCD (320x234) with saving screen (5.6" for ASR100 series)
Parameters setting	By Key nods or upper linking computer setting. Security lock function is available
Alarm	4 alarm points per channel are available. Upper/lower alarm, rate-of-change and differential limit; Alarm output delay, alarm delay high to low, external connection sound available, max 12 latest alarm messages are saved per channel.
Communication port	RS-232 , RS-485: Buad rate 1200 – 115200 bps.
Control action	Hysteresis ON/OFF relay output (AC220V/3A) is selectable.
Printer	TP μP-A40 micro printer is recommended.
Operating environment	Ambient Temperature -15 — 65 ℃, Humidity ⩽ 85%RH
Supply Voltage	95 - 260VAC 50-60Hz
Power consume	≤ 20W
Weight	Approx 3000 g (ASR100 series)

1.1.3 Memoey (Flash) capacity vs channel number, interrecord time and approx recording date :

Capacity（Mbit）	Interrecord time (S)	Channel Number	Approx recording date
32 (Default configuration)	10	1	683
		2	341
		4	170
		8	82
		12	55
	240	1	16401
		2	8200
		4	4100
		8	1984
		12	1322
64 （Extened）	10	1	1366
		2	682
		4	340
		8	164
		12	110
	240	1	32802
		2	16400
		4	8200
		8	3968
		12	2644
128 （Extend）	10	1	3415
		2	1705
		4	850
		8	410
		12	275
	240	1	82005
		2	41000
		4	20500
		8	9920
		12	6610

✧ Input type and measuring range：

Input	Mode	Measuring range	Input	Mode	Measuring range
V_{DC}	0~20mV	-9999~99999	TC	S	-50.0~1769.0℃
	0~100mV	-9999~99999		B	-50.0~1820.0℃
	0~5V	-9999~99999		K	-50.0~1372.0℃
	1~5V	-9999~99999		E	-50.0~1000.0℃
I_{DC}	0~10mA	-9999~99999		J	-50.0~1200.0℃
	4~20mA	-9999~99999		T	-199.90~320.00℃
DI	On/off	on/off		Wre 3-25	0.0~2300.0℃
	DCV input （TTL）	OFF：2.4V below ON：2.4V above	RTD	Pt100	-200.0~850.0℃
				Cu50	50.00~150.00℃

1.2 Data saving mode

1.2.1 Internal data saving

Nand Flash is used in the recorder. No battery is needed. It is safety for power incidently failure.）

No distortion from recordered data as the data was saved as 16 bits. Figure 1-2-1

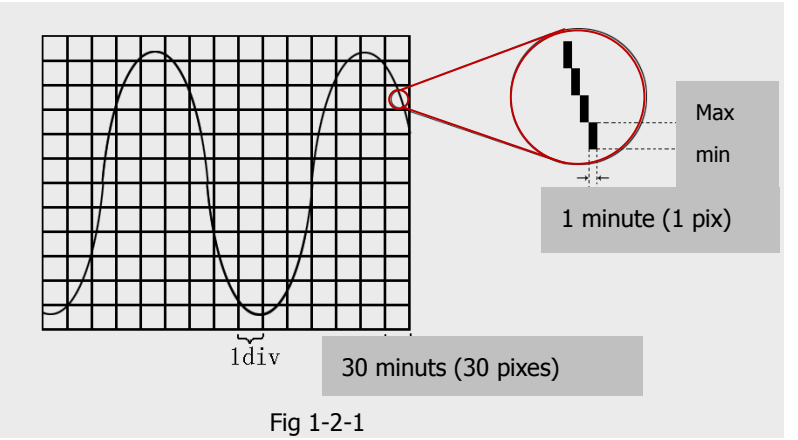


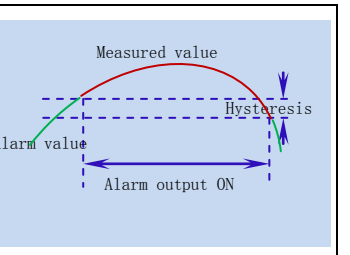
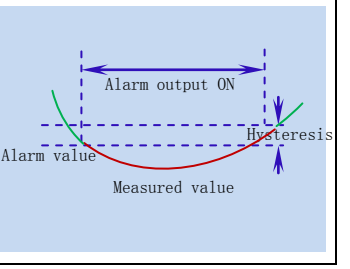
Fig 1-2-1

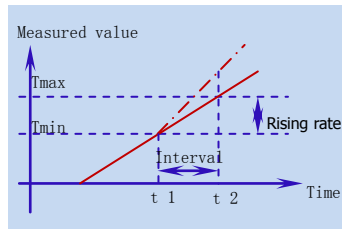
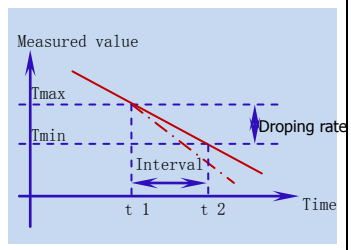
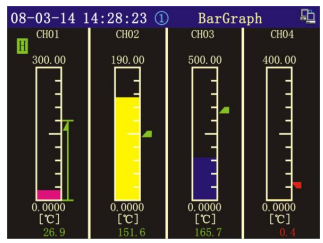
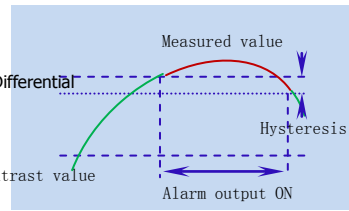
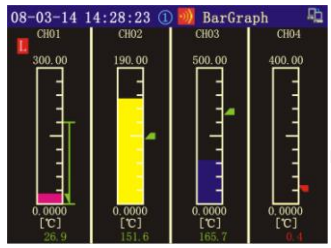
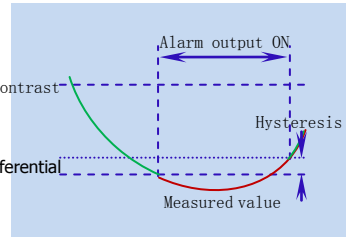
1.2.2 Data transferring

Normal U drive (2.0 versions) is used for data transferring.

1.3 Alarm

1.3.1 Alarm modes (Refer to the following table, 6 of alarm modes)

Upper limit: LED turns to red and "H" mark is display besides real time reading when alarm activated. It will return to green and "H" mark disappears after alarm relieving. Figure 1-3-1		
Lower limit: LED turns to red and "L" mark is display besides real time value when alarm activated. It will return to green and "L" mark disappears after alarm relieving. Figure 1-3-2		

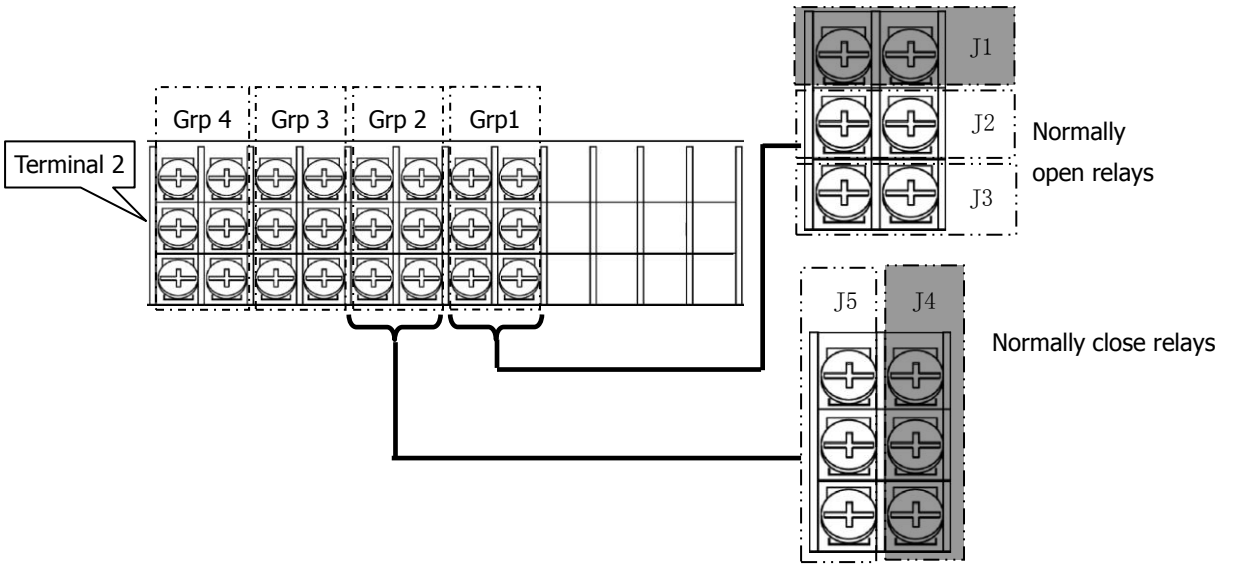
Rate-of-change upper limit When the rising rate of change is great to the designated value, the alarm activated. Alarm mark "R" display and value will turn to red. Value will return to green and "R" disappears after alarm relieving. Figure 1-3-3		
Rate-of-change lower limit: When the droping rate of change is slight to the designated value, the alarm activated. Alarm mark "r" display and value will turn to red. Value will return to green and "r" disappears after alarm relieving. Figure 1-3-4		
Differential upper limit: When value is higher than the user setting's, the alarm activated. Value will turn to red and "h" mark will display. Value will return to green and "h" will disappear after alarm relieving. The setting value may be other channel's output or user designated. Figure 1-3-5		 Differential= | Measured value − contrast value|
Differential lower limit: When value is lower than the user setting, the alarm activated. Value will turn to red and "l" mark will display. Value will return to green and "l" will disappear after alarm relieving. The setting value may be other channel's output or user designated. Figure 1-3-6		

1.3.2 Alarm marks

To confirm alarm, press " ESC ", the real time measuring value will return to normal and alarm mark will disappear.

1.3.3 Alarm outputs

Sound or signal alarm is available. User can select the relays output and connection is as below.



Notes: Maximum 12 normally open relays or maximum 8 normally close relays output can be configurated in the ASR-100 chart recorder.

2. Installation and wiring

2.1 Attention:

2.1.1 Attention in instrument using

There are many plastic parts in this instrument panel. Please do use dry soft cloth for cleaning. Solvents are not allowed for cleaning. Please keep the LCD screen away from any sharpen goods. Please keep any mechanical impact away during the instrument working. It might cause internal component damage or system breaks down. Turn off the power for any maintenance if necessary. Please contact our customer service department or local dealer if any unusual sound, belches smoke or unusual smell was found.

2.2 Installation

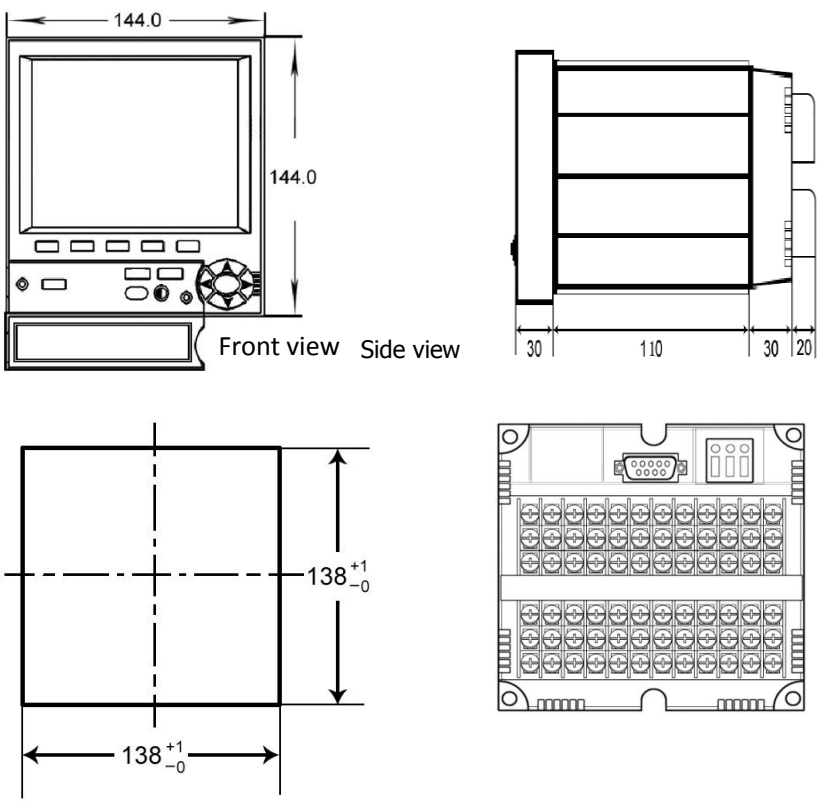
2.2.1 Enviroment

To ensure the instruments be normal working, non-strong interference control panel is strongly recommended to be installed on and the panel steel plate thickness should not be lower than 4mm.

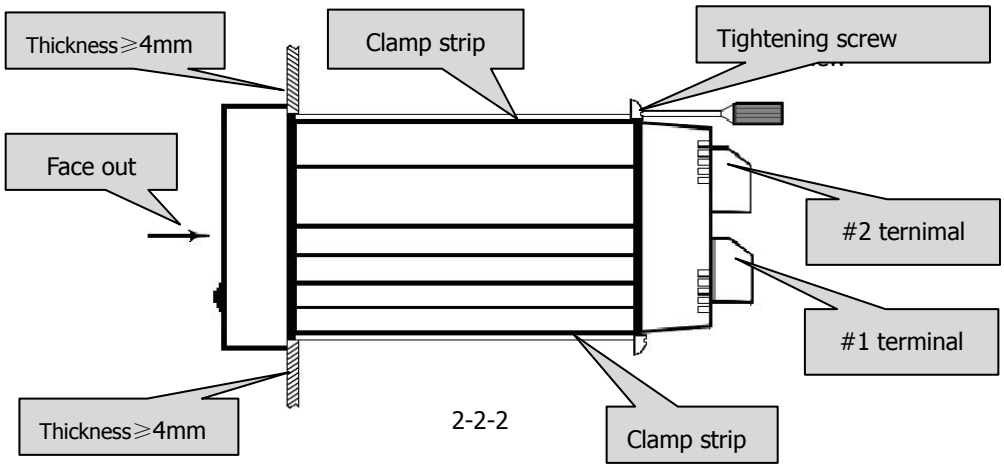
The instruments operating ambient temperature: -15℃ - 60℃, humidity: 10% - 85% (without condensation) is recommended.

Please keep away from the direct sunlight, the multi-steam, the multi-caustic gases and the source of the electromagnetism environment.

2.2.2 Install Diamemsion – ASR100 (unit: mm)



2.2.3 Installation (Figure 2-2-2)



2-2-2

2.2.4 Terminal description

Terminal arrangements are descripted on Figure 2-2-3-A and Figure 2-2-3-B.

Signal input / Control output：

Input/Output terminal symbol	Description
L、N、G	Power terminal and Grounding
A、B、C	Analog input terminal，Max 12 channels (ASR100)
P+、P-	DC24V Power output terminals, Max 6，30mA each，for converter power supply
J	Relay output terminals, Total 12，relay: 250VAC，3A

2.2.4.1 Terminal

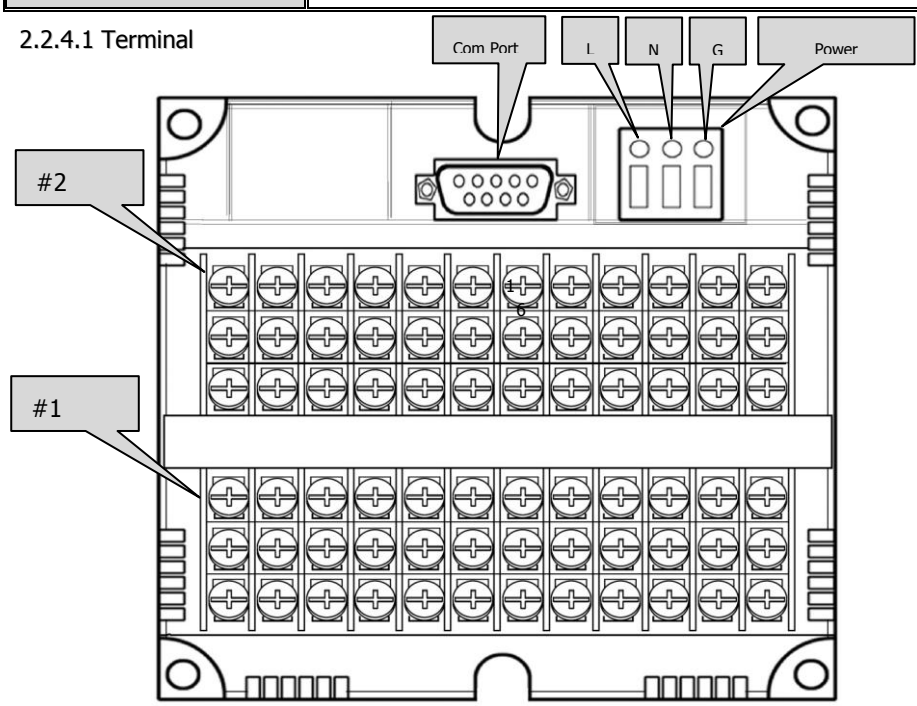
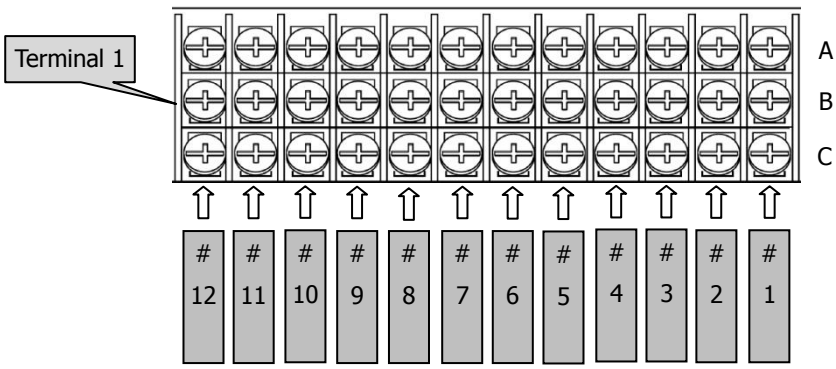


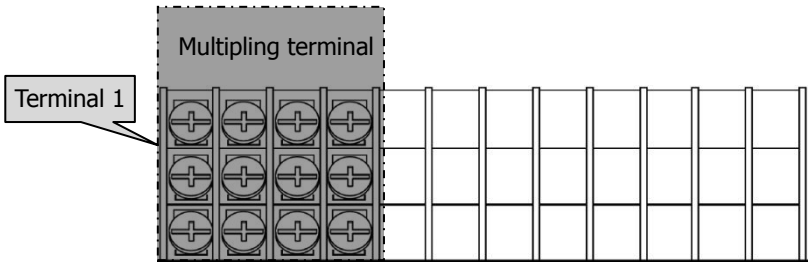
Figure 2-2-3-A

2.2.4.2 **Analog input wiring diagram**



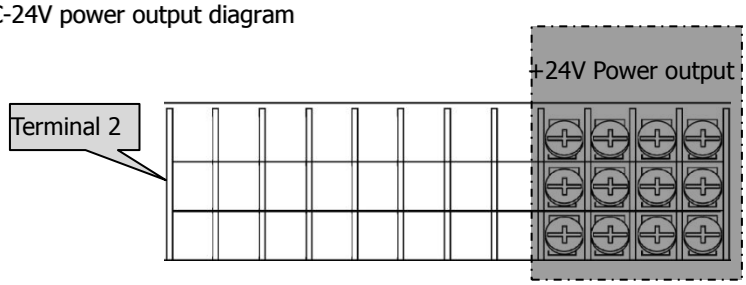
Maximum 12 channels input will be available.

2.2.4.3 Multiple terminal diagram



Universal input channel #9 to #12 can be set to for multipling terminals as special signal input terminals. In this case, the maximum universal input will be 8 channels.

2.2.4.4 DC-24V power output diagram



2.2.4.5 **Relay output terminal wiring diagram**

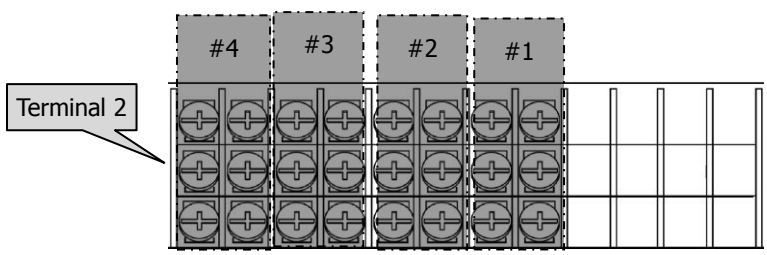
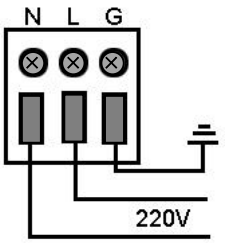


Figure 2-2-3-B Terminals

2.2.5 Wiring description

2.2.5.1 **Power Connection**

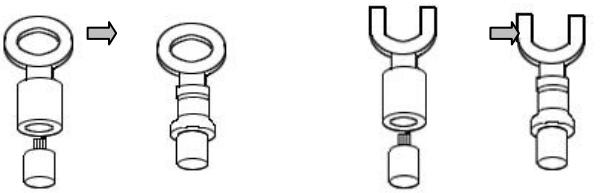
1. (Line), N (Nuture), G (Ground)
2. Before wiring inputs ensure power supply is AC90-260V
3. Input wiring must be under power off condition.



2.2.5.2 **Input signal connection**

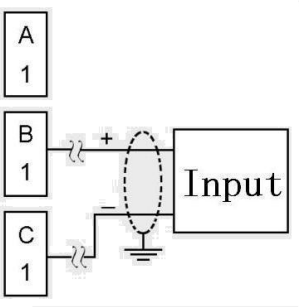
Analog input signal connection and wiring are shown as Figure 2-2-4 and 2-2-5，Converter connection is shown as Figure 2-2-6.

- remove terminal cover
- For your convenient, wiring should be from low to high
- Connecting all cable lugs with power off condition
- Recover it after completing

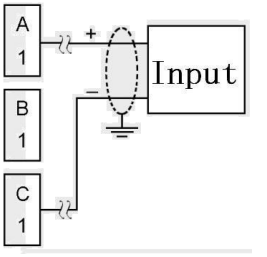


Plastic cable lugs (4mm)

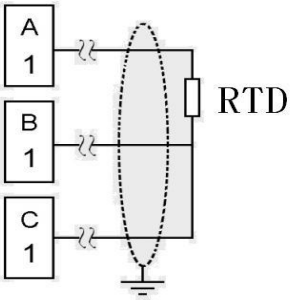
（The following wiring is an example for single loop input. Other each is similar.



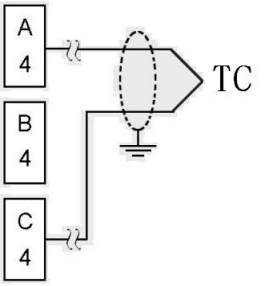
Current (4-20mA) input



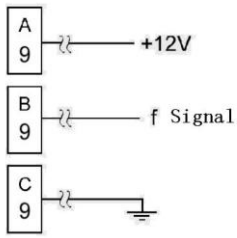
Voltage output



RTD input



T.C input



Frequency output

Figure 2-2-4 Analog input diagram

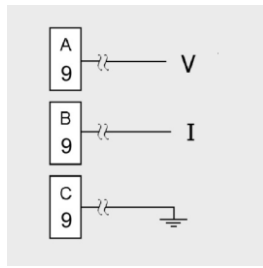
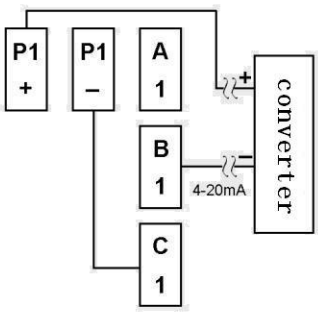
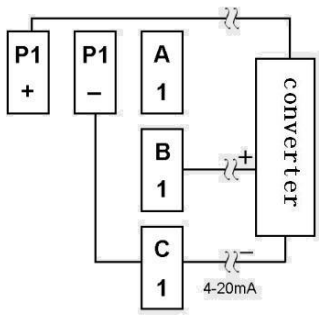


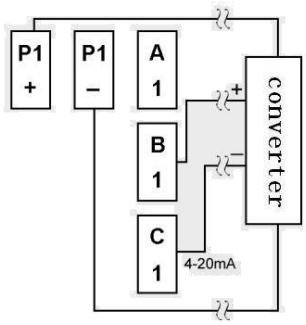
Figure 2-2-5 Frequency input、transmitter wiring diagram



2 wires transmitter



3 wires transmitter



4 wires transmitter

Figure 2-2-6 Transmitter wiring diagram

2.2.5.3 Communication wire connection

1、 RS-232C connection

The RS-232C port is at the back of the instrument.（Figure 2-2-7-A and 2-2-7-B），It can be used for both data transferring with computer and serial printer as well.

The transmission line should use the shielded twisted pair, the length should be less 10 meters.

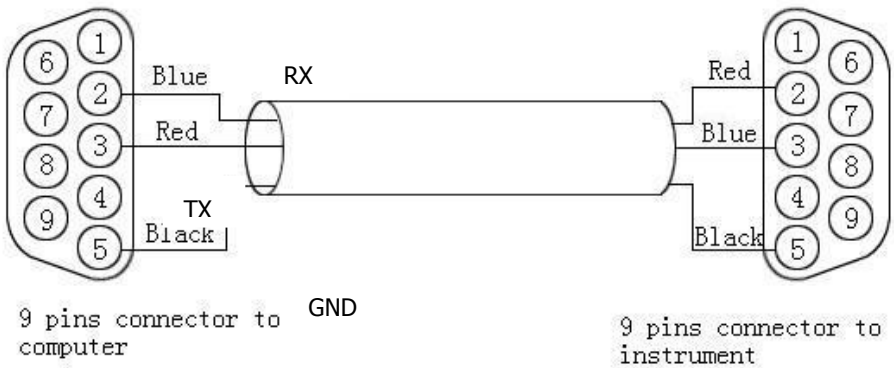


Figure 2-2-7A RS-232C com between computer and instrument

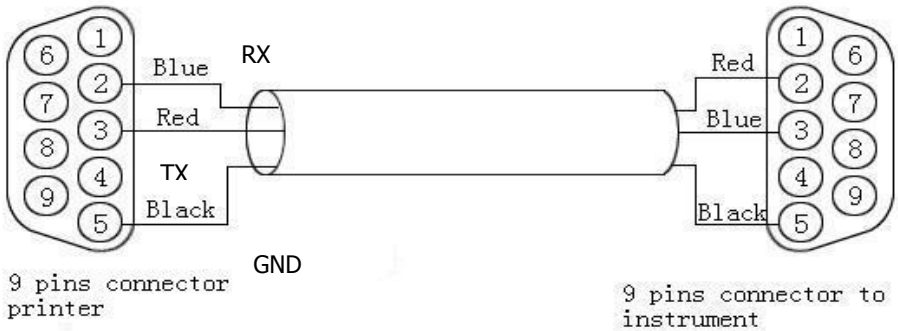


Figure 2-2-7B RS-232C com between printer and instrument

2、 RS-485 Com connection

By using RS-485 communications with the computer, communication converter (RS232 to RS485) is needed. See Figure 2-2-9. The RS-485 transmission line should use the shielded twisted pair. When the baudrate is up to 19200bps, the maximum transmission line will be less than 1000 meters. In order to reduce the signaling and the echo trouble, please install 120 ohm terminal resistances in the both sides of transmission line. (e.g. Figure 2-2-8)

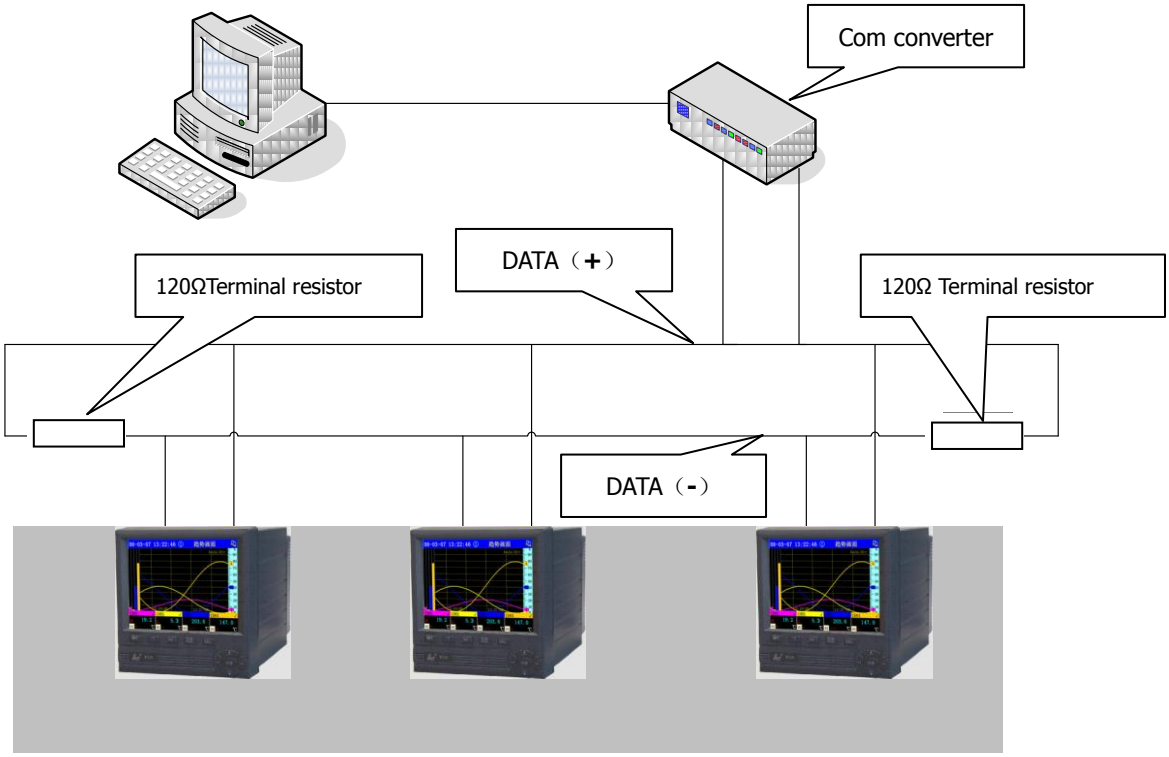


Figure 2-2-8 485 Com connection diagram

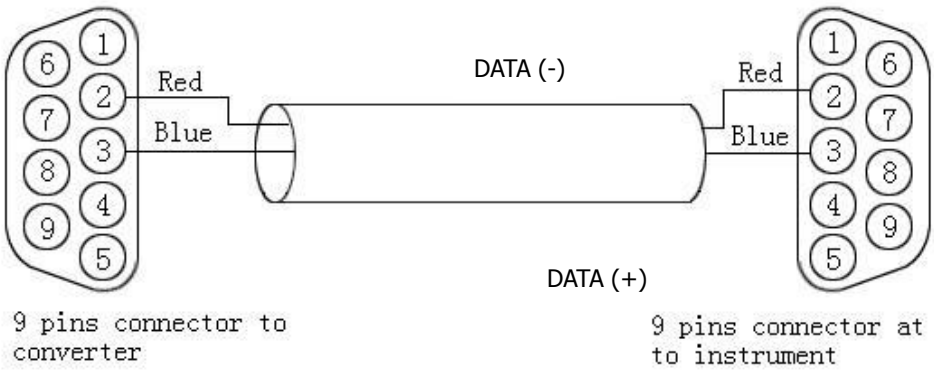


Figure 2-2-9 Com convertor to instrument RS485 connection

3 Operating

3.1 Power on

Turn on the power with the grounding. (Default configuration is 220VAC). (First time power on is suggested that do not connect any input). After 4 Seconds initialization, below status will be seen.

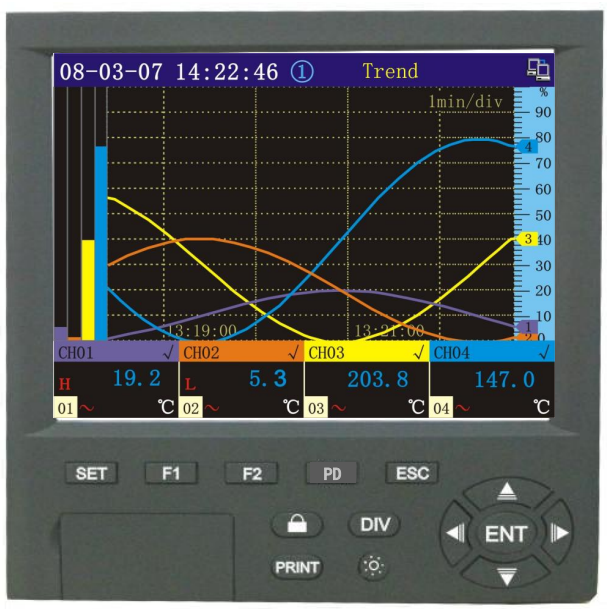


Figure 3-1-1

3.2 Key pads operating

There are 14 function kays as 3-1-1 shown.

◀ ▶ Channel selection Left/Right shift.

▲ ▼ Change display modes.

ENT For confirming the function or selecting menu;

ESC Escape from the current operation;

DIV In the main and history recall page, 4 grades of time/div can be selected;

SET Press "SET" + "▶" goto instrument configuration setting;

F1 "F1" is a special function key. It will combine with other keys and perform some special functions. It will descript later;

F2 "F2" is another special function key. It will combine with other keys and perform some special functions. It will descript later;

"Lock"key is for the parameter setting protection. LCD right up site will show the locking mark. Unlock status, the display will be back to default automatically after non-key touching 4 mins;

PD "PAGE DOWN" key is used for channel pages (group) display switching.

PRINT Print + "F1" will print out channels real time data or curve selectable.

It is for the brightness adjusting.

3.2.1 Brightness adjustment

Press , as Figure 3-2-1 shows, ▲ &▼ key will be able to adjust brightness. Press ESC to save the setting and back to system. 30 grades are available for setting. Higher is brighter.

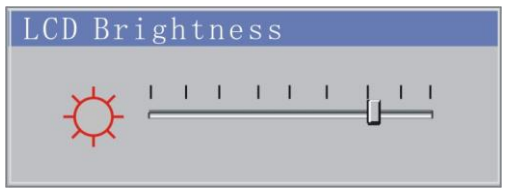


Figure 3-2-1

3.2.2 Display modes

- As Figure 3-2-2 shown, Press" ▲ ▼"to select the display modes.
- Press "ENT" and select by manu.

Figure 3-2-2

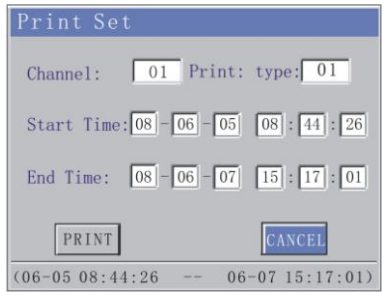


Figure 3-2-3

3.2.3 Curve and real time data printing

Press "PRINT", you can see printing setting. As Figure 3-2-3 shown, you can select related CH of curve or data with start and end time for printing. Users can also press "PRINT"+"F1"to print all channels data. The communicating status will see and alternate twinkling.

3.2.4 Configuration setting

Press "SET" + "▶", will see "PUR password" as Figure 3-2-4. Press "◀" shift forward and press "▶" shift back ward. Press "ENT" to change user's name and "▲ ▼" or "▲ ▼" to change the password.

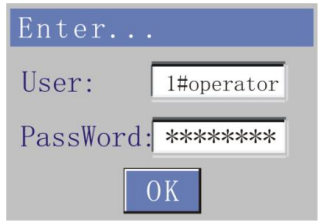


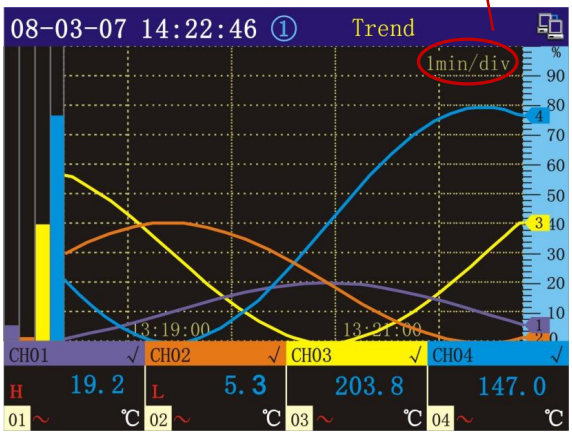
Figure 3-2-4

3.2.5 Time DIV

Under trend, single CH and History recall display, press "DIV" will change display curve time division rate. Refer to Figure 3-2-5.

DIV = Interrecord time* Time indice

DIV =Interrecord time* Time indice



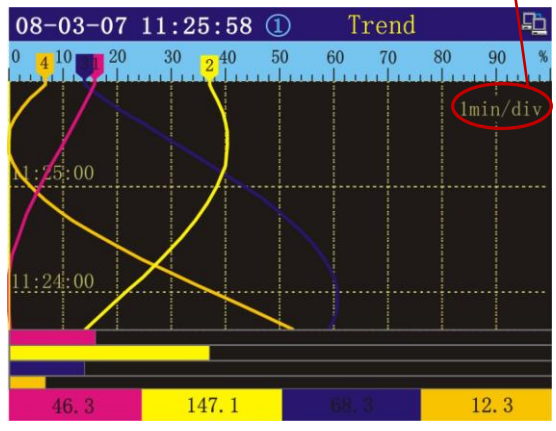


Figure 3-2-5

3.2.6 Curve amplitude

Under trend, press " ENT " to trend, → Group → curve range setting will be 0-100%. It can be set to e.g. 20 – 80% accordingly.

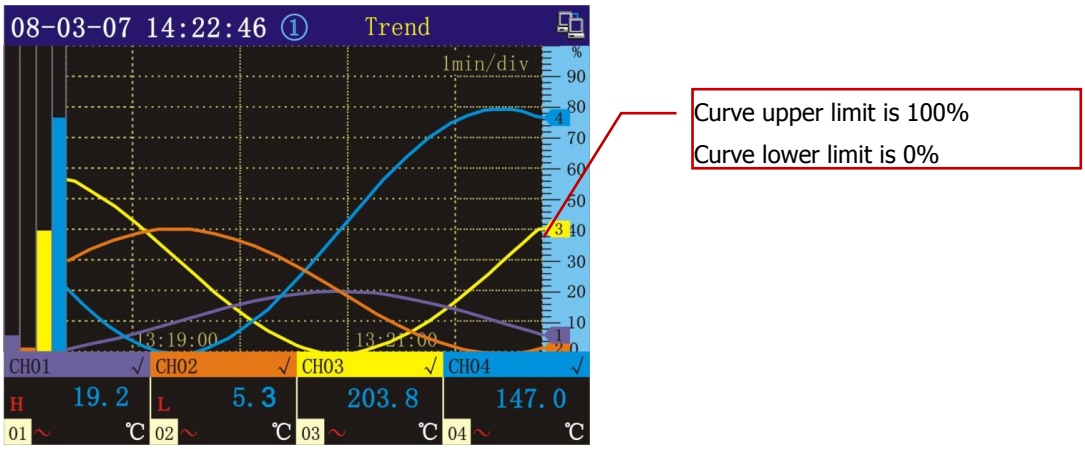


Figure 3-2-6

3.2.7 Display menu

Under system display, press "ENT" goto display menu. There are total 3 levels menu as shows in Figure 3-2-7. " ▶ " mark is showing that there are more option in the menu of the following levels.

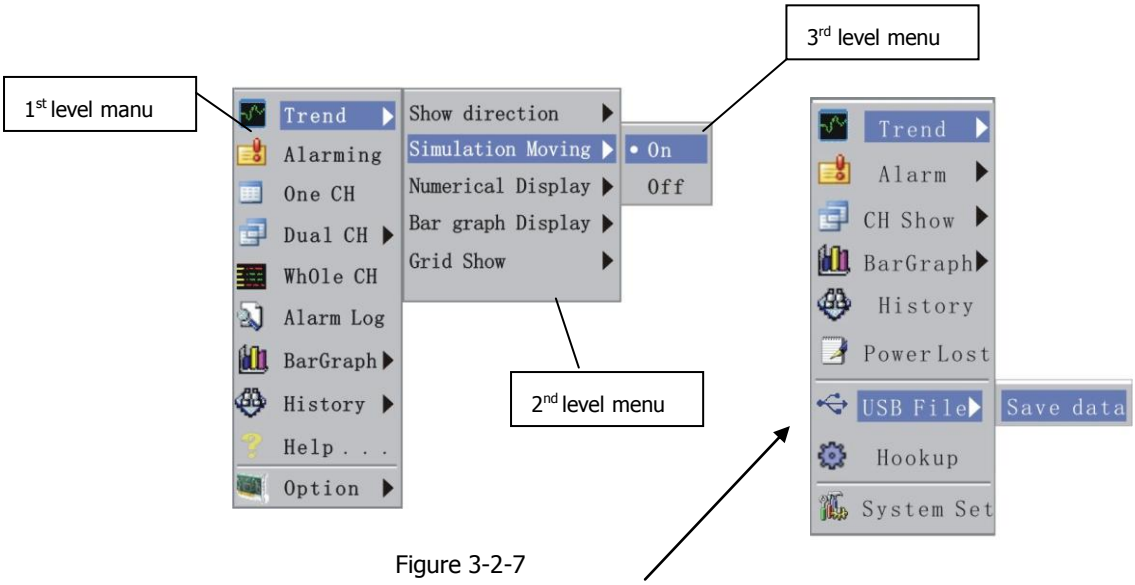


Figure 3-2-7

Note: For some new revsion recorder, once the U drive inset into the recorder, it will active "U drive option" functions: either to save data or to upload software from U drive.

3.2.8 Alarm

Red alarm mark twinkling is showns that alarm is activated. Press " ESC " the alarm mark will return to green and alarm relieves.

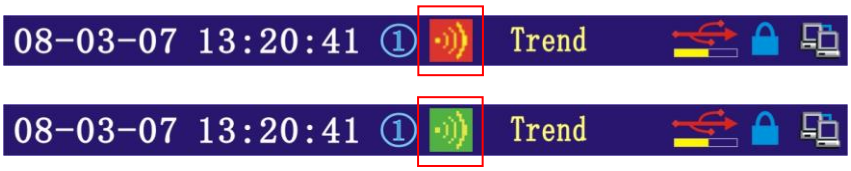


Figure 3-2-8

3.2.9 USB data transferring

SWP-ASR100 chart recorder is allowed normal U drive for data transferring.

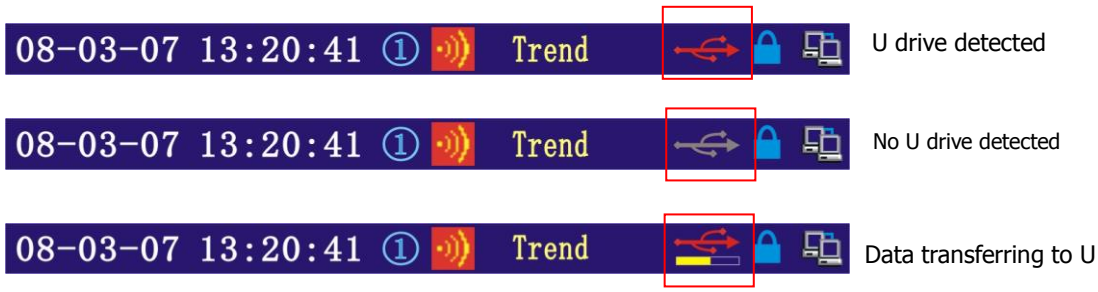


Figure 3-2-9

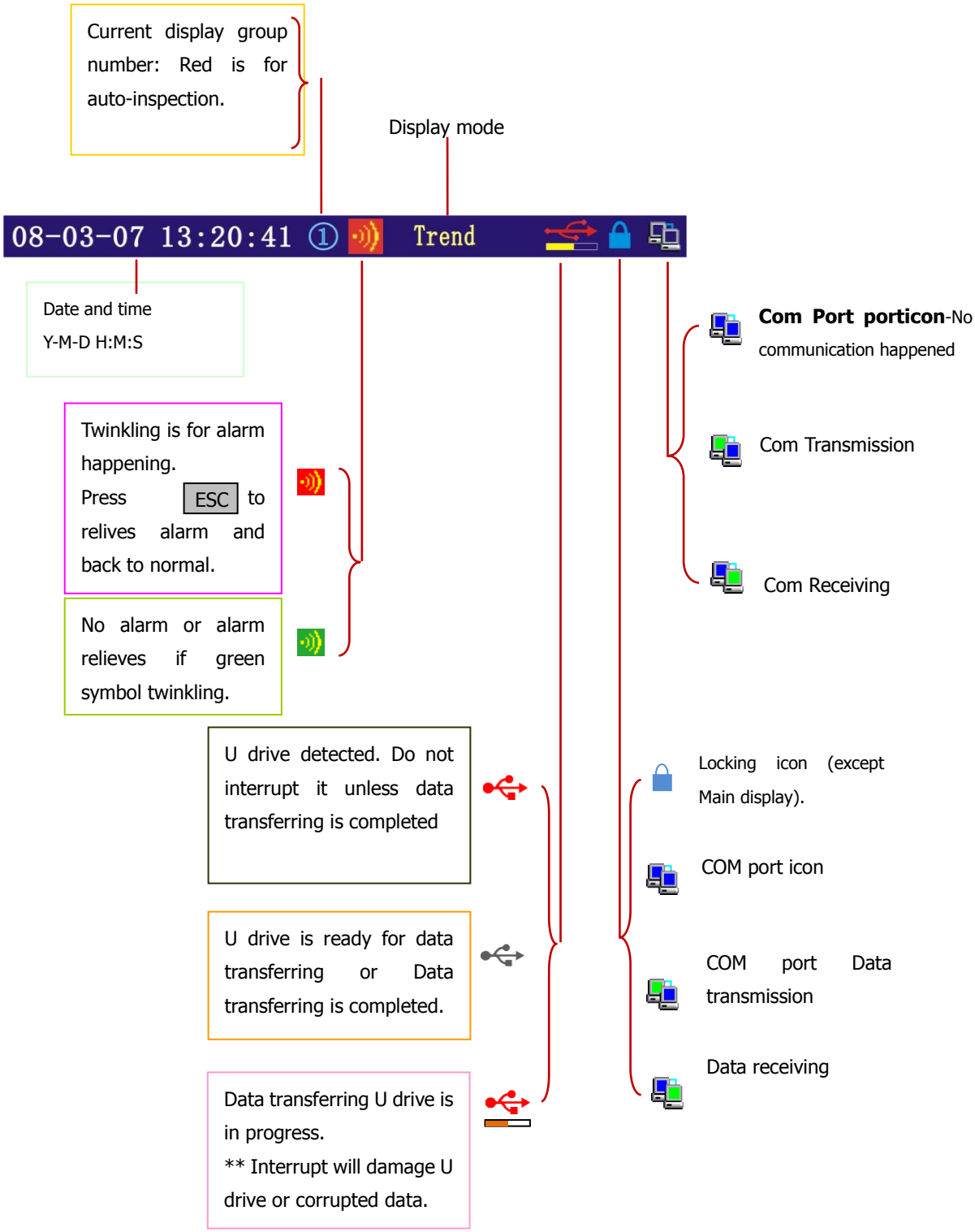
The data transfer completed when symbol changed color from red.

3.2.10 Screen lock

Press " " lock the current display. Otherwise it will return back to Main automatically after 4 minutes duration without operating.

3.3 Instrument status display summary

Figure 3-2-10


Current display group number: Red is for auto-inspection.
Display mode
08-03-07 13:20:41 ① Trend
Date and time
Y-M-D H:M:S
Com Port porticon-No communication happened
Com Transmission
Com Receiving
Twinkling is for alarm happening.
Press ESC to relives alarm and back to normal.
No alarm or alarm relieves if green symbol twinkling.
U drive detected. Do not interrupt it unless data transferring is completed
Locking icon (except Main display).
COM port icon
U drive is ready for data transferring or Data transferring is completed.
COM port Data transmission
Data receiving
Data transferring U drive is in progress.
** Interrupt will damage U drive or corrupted data.

4 Operating description

SWP-ASR100 is a TFT with system configuration and help function（included: multi-channels main display, alarm display, single/dual/whole channels displays, bar graphic, history recall and even log as well.

4.1 Trend

Trend display is shows as Figure 4-1-1. It is included bar graph and channel real time data as well.

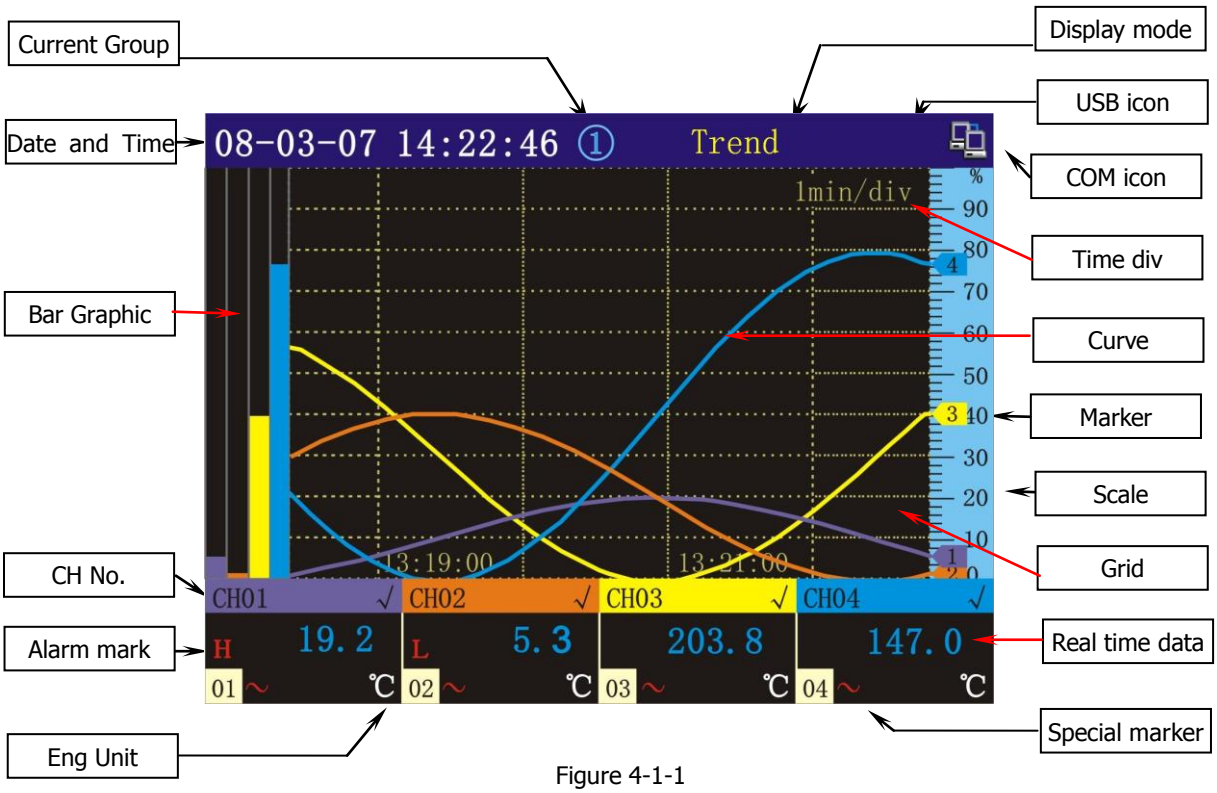


Figure 4-1-1

Key operating

	Move the cursor to individual channel for function mark option.
	Change display mode, by using  keys to select the ON/OFF of curve display
PD	Change channel display mode

Vertical diplay, real time readings are in different display mode.

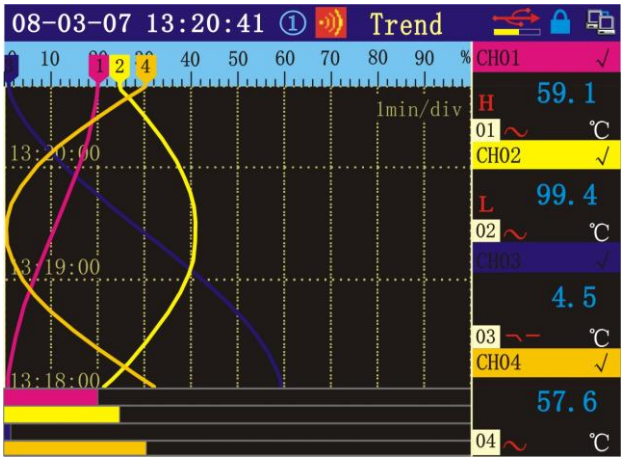


Figure 4-1-2

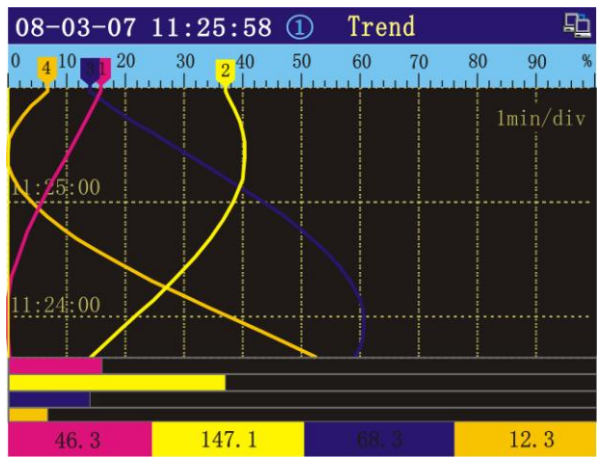


Figure 4-1-3

4.2 Alarm information

It displays 4 alarm modes for all channels.

H: Upper limit alarm

L: Lower limit alarm

J3: Action relay number.

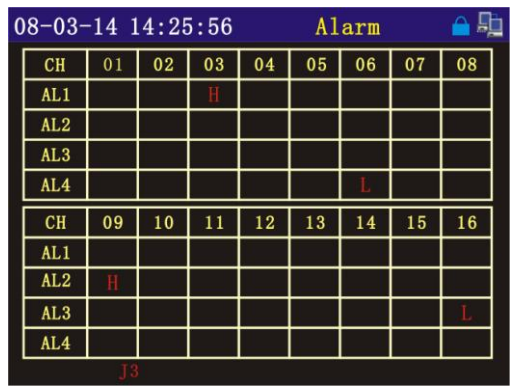


Figure 4-2-1

4.3 Single channel

Figure 4-3-1 is a single channel display mode. It will include real time data, display curve, bar graphic and alarm status as well. Measuring data will change to red color once alarm to be activated.

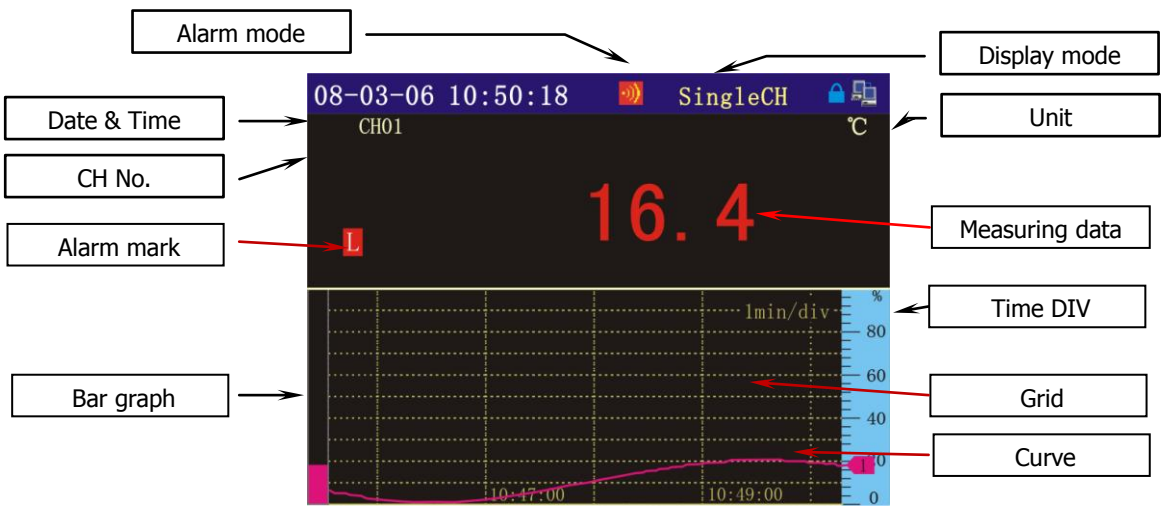


Figure 4-3-1

4.4 Dual channels

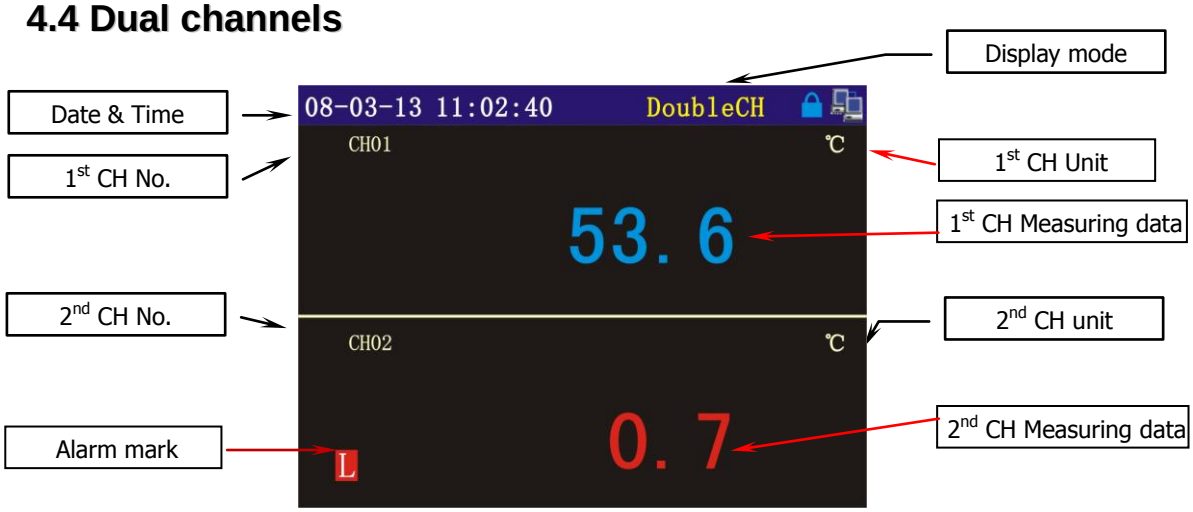


Figure 4-4-1

4.5 Whole channels

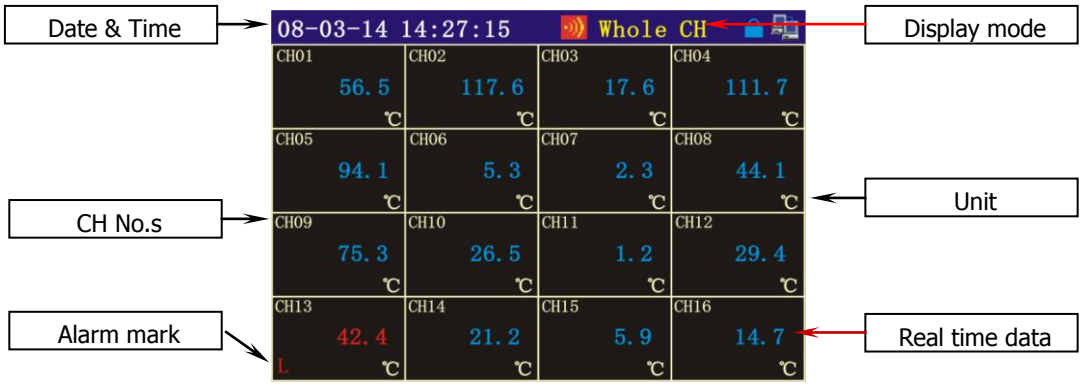


Figure 4-5-1

4.6 Alarm log

The latest 12 alarm messages per channel are saved in alarm log. The messages are included alarm happening/relieving time, alarm channel number, alarm points and alarm mode as well. Alarm mark turn to red, it means alarm is happening, green means alarm is relieving.

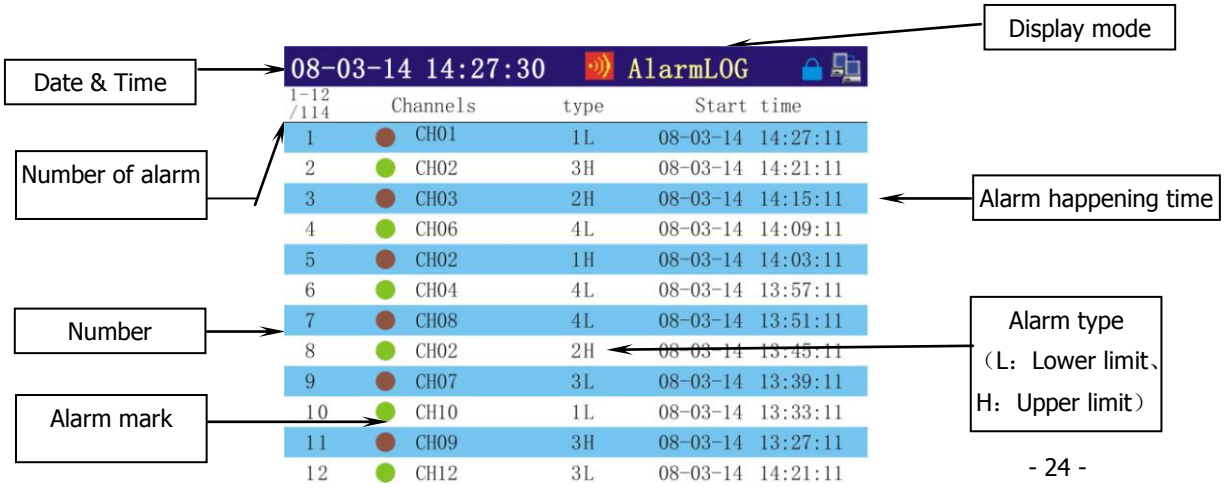


Figure 4-6-1

4.7 Bargraph mode

Bargraph display can be separated into 6 groups and maximum 8 channels per group. As shown in Figure 4-7-1. It can be in both vertical and horizontal display mode. Shows in Figure 4-7-2.

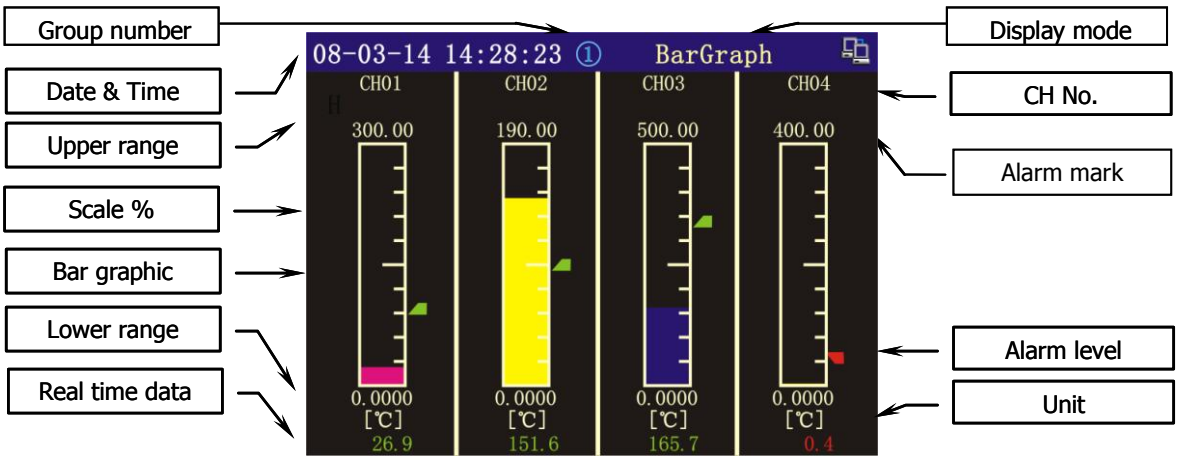


Figure 4-7-1

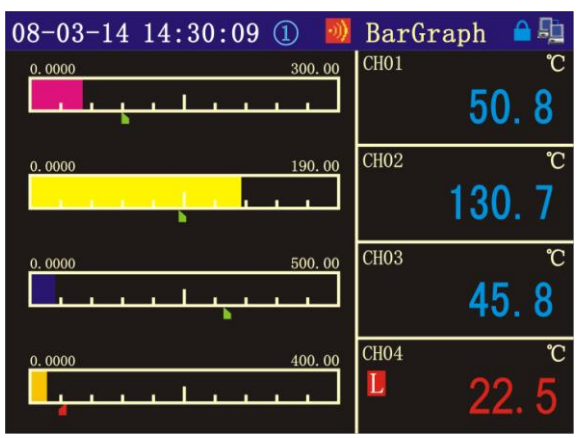


Figure 4-7-2

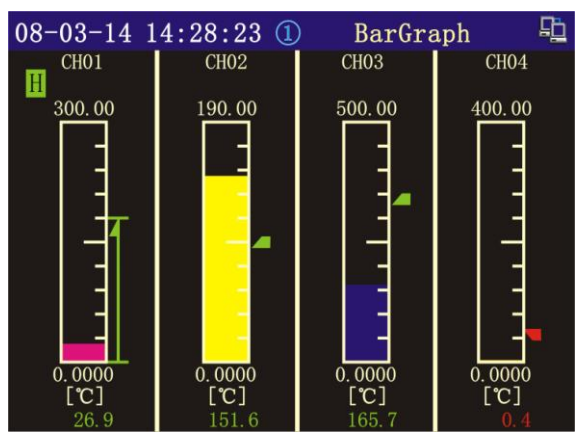


Figure 4-7-3

4.8 Power failure log

It displays the instrument power failure (off) record information. It included: total number of power failure (off), duration per power failure (off) and total power failure (off) accumulating time. There are maximum 11 messages per display. Refer to Figure 4-9-1.

Figure 4-9-1

4.9 Operating description: (General operating)

DIV	There are 4 options in time DIV display mode
◄ ►	Move cursor on channel display mark
▲ ▼	CH disables or enable in CH operating mode
▲ ▼	After ESC, it is for display page up and down;
ESC	Drawing back from any setting;
PD	- Change CH group page; (display)
	- Switch to next of 11 power failure record if have; (PF log)
	- Terminal connection mark and wiring diagram; (wiring)
	- Switch to next 12 of alarm record if have. (alarm log)
ENT	Go to manu;
PRINT	For history data printing and + F1 for channels real time

data printing.

SET + ▶ Go to configuration setting.

F1 + ▲ Help on line.

Brightness adjusts.

Screen locks mark. Screen locking mark. When screen locked, there is a lock mark display on right top corner. If the screen unlocking, the display will switch back to trend display automatically in 4 minuts if keys non-operating.

4.10 History recall

The history recall trend is used for history data inspecting. It is similar with main display as Figure 4-8-1. There is a time period display under the real time for history recall trend. The value in the recall time period is displaied the measured value upper/lower limit. In the recall trend, the dashed lines expressed the recall locator axis, indicating the position of current recalls which the plot point locates.

The recall displays are with stepping recall, continually recall and timer recall. It can be switched by " PD "to display the group number, " SET "to change the recall modes.

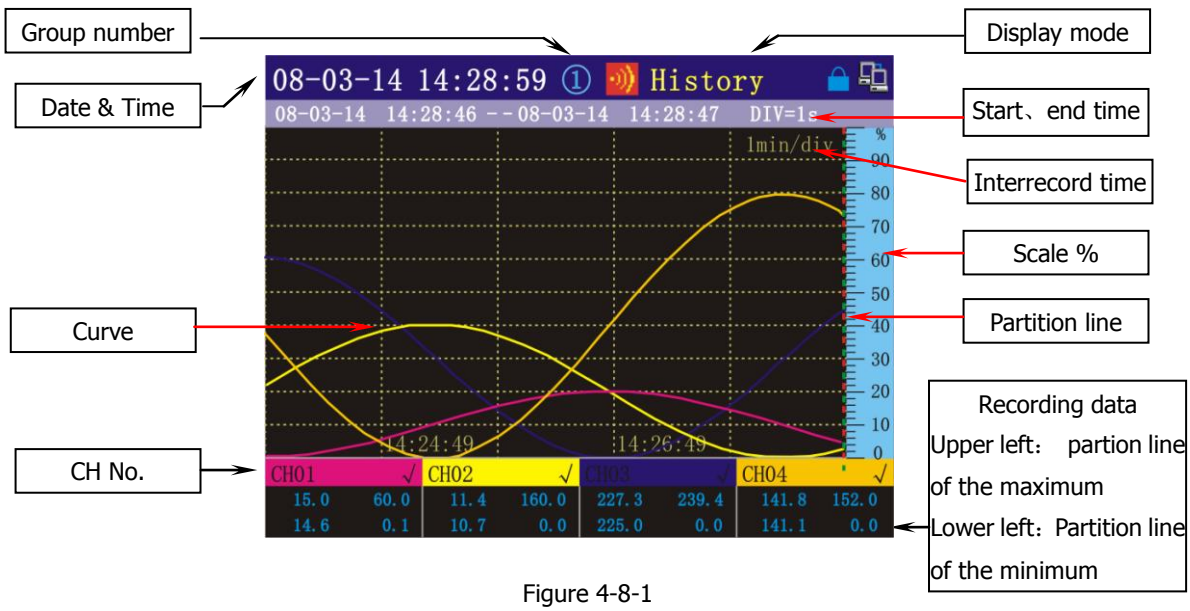


Figure 4-8-1

Operating and displaying description:

" SET " There are : Stepping recall, continue recall and timer recall according to "recall

modes" setting.

" ◀ " " ▶ " Move cursor on channel display mark to select recall channel.

" ▲"、" ▼ " Enable / Disable CH

" ESC ": Escape from recalling function back to current status.

Stepping recall Recall the curve either forward the locator axial, or moves a curve backward step by step.

" ENT " Step: Alternate the curve localization axis for the dashed or the solid line.

" ◀ " In horizontal display, curve will shift to left if the axis is dashed line, or, the localization axis shifts to left if the axis is solid line.

" ▶ " In horizontal display, curve will shift to right if the axis is dashed line, or, the localization axis shifts to right if the axis is solid line.

" ▲ " In vertical display, curve will shift to up if the axis is dashed line, or, the localization axis shifts to up if the axis is solid line.

" ▼ " In vertical display, curve will shift to down if the axis is dashed line, or, the localization axis shifts to down if the axis is solid line.

- Continue recall: After the determination recalls the direction, the system recalls automatically according to the stipulation gap number migration.

" ◀ " In horizontal display, curve will shift to left.
Functional instructions change to << 01

" ▶ " In horizontal display, curve will shift to right.
Functional instructions change to >> 01

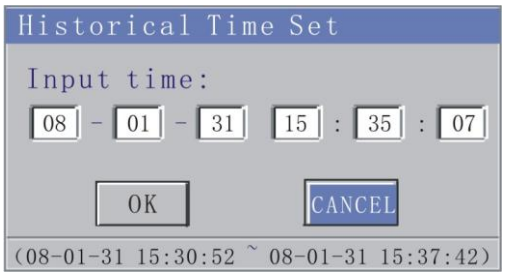
" ▲ " In vertical display, curve will shift to up.
Functional instructions change to ≍ 01

" ▼ " In vertical display, curve will shift to down.

Functional instructions change to ≯ 01

- << 01 、>> 01 、≮ 01、≯ 01 are curve shifting directions. Number is the step number.

- Timer recall Input recall time period:
  Press" ENT ", there will be a window showing as below Figure 4-8-2：



With ◀ and ▶, cursor will select date and time location. With ▼ and ▲ will select corresponding date and time user would like recall to. ENT It to confirm the recall period will follow the time setting.

Figure 4-8-2

4.9 Instrument configuration

It will include instrument hardware and software information:

- Instrument mode number
- Software version
- Serial number
- Flash space and recording duration capability
- Circuit diagram

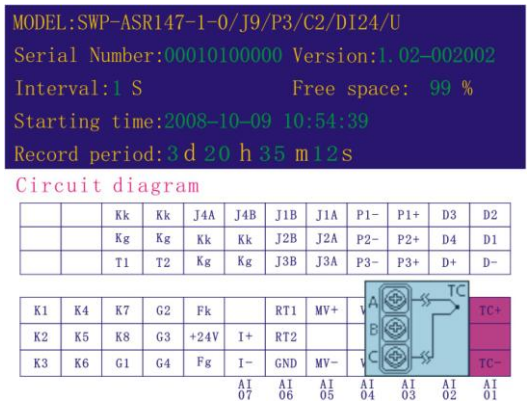


Figure 4-10-1

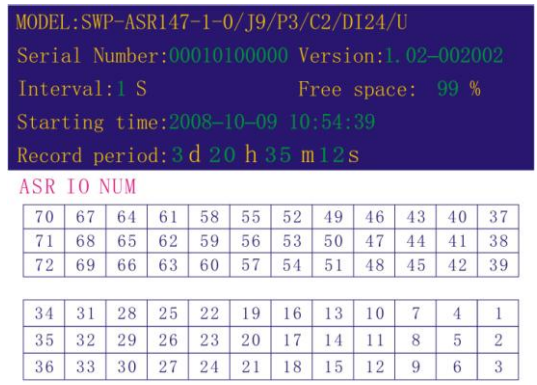


Figure 4-10-2

4.11 On line help

There are two parts of on line help. First part will display function and usage. Second part will display operating guide. Figure 4-10-3:

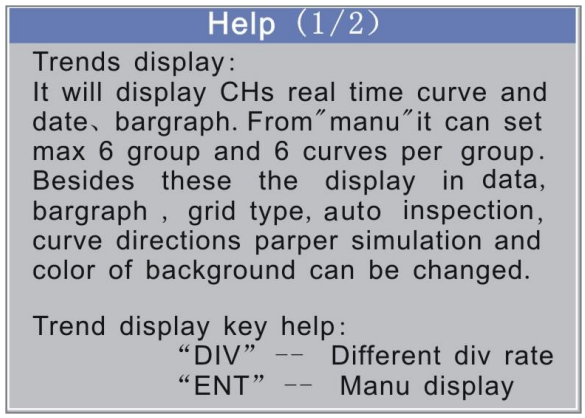


Figure 4-10-3

Note：Under difference display, press F1 + ▲ will get on line help instructions. PD will show the next page if help instruction is more than one page. ESC will escape back from help function.

5 Configuration setting

5.1 Go to configuration setting

1) Enter the configuration setting display

"SET" + " ▶ " will display PUR setting page as below.

Figure 5-1-1

2) Selection

Press " ◀ " or " ▶ " and " ▲ ▼ " select user and password the press ENT to edit the configuration setting of the system.

3) Edit the configuration

Press " ◀ ▶ " to select the object and press " ENT " for editing.

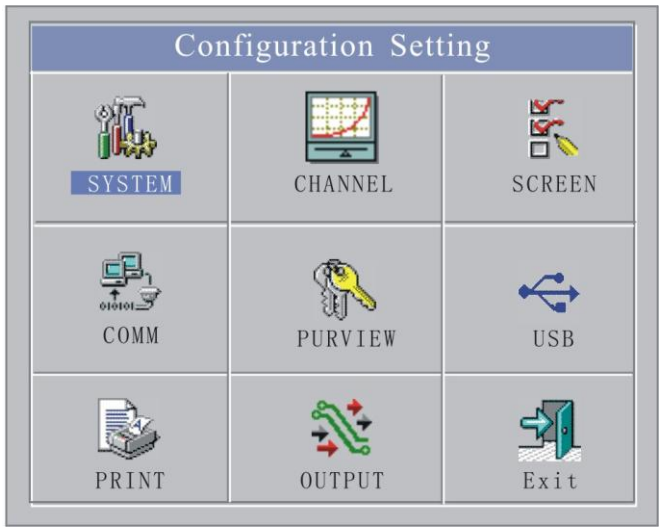


Figure 5-1-2

5.2 Configurations and parameters

5.2.1 System configuration

As shows in below: the edit objects are: date, time, password, channel numbers, interval record time, time DIV, TC open circuit display, key sound ON/OFF and screen saving as well.

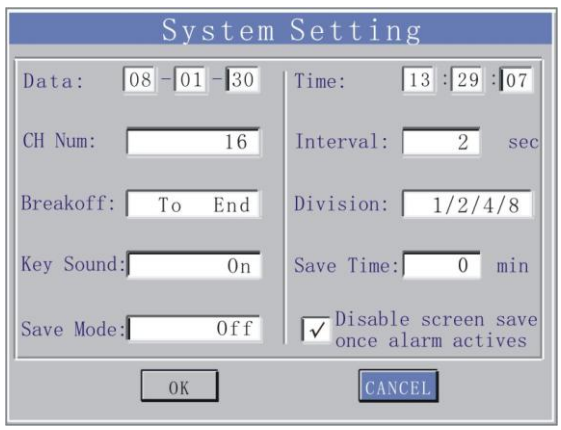


Figure 5-2-1

Name	Setting range	Description	Factory
Date	yy - mm - dd	Default	Real time
Time	h : m : s	default	Real time
Password	00000000—99999999	Preset	0000000000
No. of channels	1 – 12	Preset recording channels	Real
Interval time	1 – 600 S	Interrecord time	4S
Time / Div	1 – 4 (type)	1：Rate change as 1，2，4，8 2：Rate change as 1，2，8，16 3：Rate change as 1，4，8，24 4：Rate change as 1，4，16，48	1
T.C Burnout	Hold Goto beginning Goto ending	Hold on the present value Display lower limit scale Display upper limit scale	Up scale
Key sound	On/Off	On: Key press with sound Off: Key press without sound	On
Screen saver delay	0 – 60 minutes delay	Screen saver delay time setting （Screen saver activated after delay time if no key operating）	0 Minute
Screen saver modes	Darkest darker dark slightly unavailable	Darkness level after screen saver activating	Unavailable

5.2.2 Channel configuration

- Channel input configuration setting
- Alarm setting

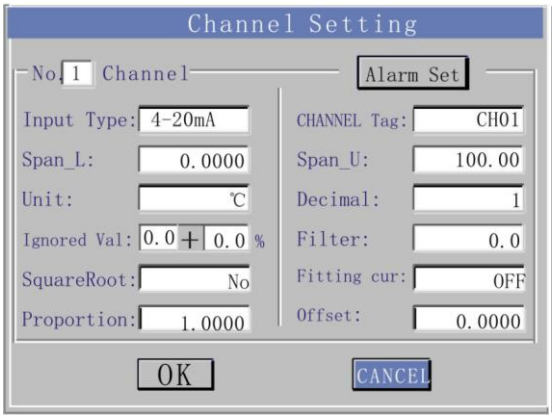


Figure 5-2-2

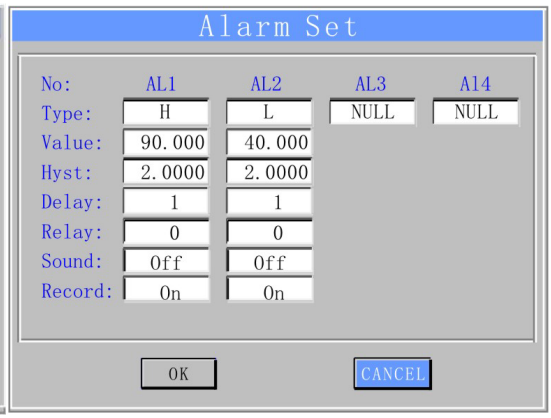


Figure 5-2-3

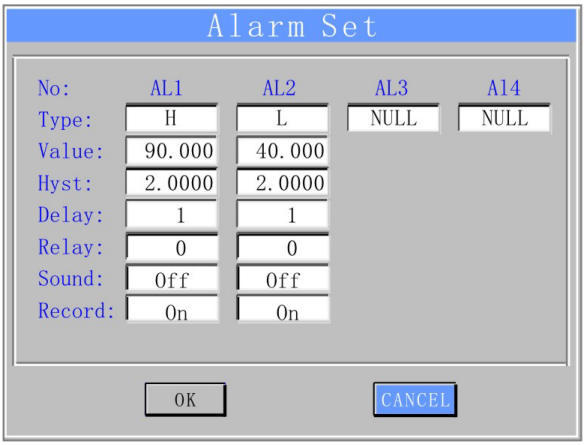


Figure 5-2-4

Note：In alarm setting, NULL is no alarm available. "H" is alarm upper limit; "L" is alarm lower limit; "R" is rate-of-change upper limit; "r" is rate-of-change lower limit. "h" is differential upper limit and "l" is differential lower limit. Figure 5-2-3

For the differential alarm, presents a single direction arrow in the bargraph. The upper limit alarm arrow is upward and the lower limit alarm arrow downward. In arrow scope with green is for alarm safe, otherwise is alarm status with red arrow. Figure 3-2-8

To set "differential" alarm, "comprison value" is requested. " ENT " will display setting window as Figure 5-2-5 shown. " ▼ "、" ▲ " can be used for value setting in all channels. Figure 5-2-4

Figure 5-2-5

Name	Setting range	Description	Factory setting
Channel	1 – 16	Parameter setting for related chane	Real
Input Type	RTD, T.C, Freq, Ⅱ、Ⅲ standard signal. cal	Instrument input signal mode （can be special request）	Real
Measuring range	-9999 – 99999	Measuring lower and upper range	0.0000 – 100.00
Tags number	CH01 – CH12	Channel definition	"CH01"—"CH12"
Unit	See"Engineering unit"	Real time measurement engineering unit display	℃
Filter	0.0 – 9.9	To stable measuring value	0
Decimal point	0 – 3	Decimal point for value display	1
Ignored level	0 – 25.0%	To cut off small signal in %	00.0%
Squre root	Yes/No	Result squre root process	No
Zero offset	-9999 – 99999	0 value calibration	0.0000
P offset	-9999 – 99999	Input signal proport offset	1.0000
Linear fiting	No. of curves	Curve linear fiting by sectors	No

[Note 1]：When T、S、K、J、E、B、W mode was selected, press ENT , there will be an "TC_CTC （Setting）" as shows in Figure 5-2-6.

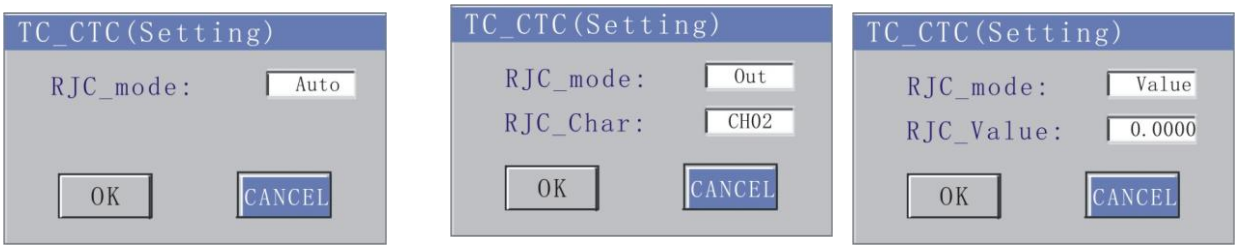


Figure 5-2-6

If input signal is lower or higher than range setting, system will remind it.

Engineering unit table

Unit type	Engineering unit
Temperature	℃、℉
Pressure	bar、mbar、mmHg、mHg、mmH_2O、mH_2O、kgf/cm^2、atm、Pa、KPa、MPa
Flow volume	t/s、t/min、t/h、L/s、L/min、L/h、Kg/s、Kg/min、Kg/h、m^3/s、m^3/min、m^3/h、Km^3/s、Km^3/min、Km^3/h、Nm^3/s、Nm^3/min、Nm^3/h
Weighth	t、Kg、g
Volume	mL、L 、KL 、mm^3、cm^3、m^3、Nm^3
Heat enegy	KJ 、MJ、GJ、KJ/h、MJ/h、GJ/h、W、KW、MW、WH、KWH、KJ/s、KJ/min
Electrical	A、KA、mA、V、KV、mV
R.P.M	r/min
Density	PPM
Distance	um、mm、cm、m、Km
Others	Hz、KHz、%、‰、us/cm、KN、CRN、CRV、PPB、%RH、$\%O_2$、mg/m^3、PF/m、NTU、m^3/day、MΩ、ug/L、mg/L、CPS、PH、Kg/m^3、mg/m^3、 PF/m、%LEL、rpm、%Bar
Special request	Description in the ordering *1

*1 Note：8 of unit setting are reserved for user in special requesting. Figure 5-2-12: User will be able to define their special units from "def1 – def8"

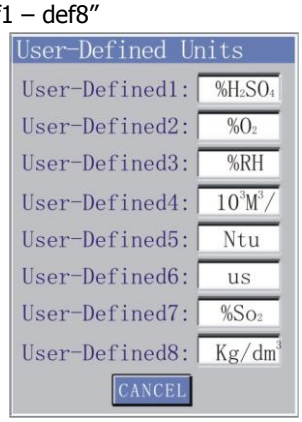


Figure 5-2-12

5.2.3 Display configuration

" √ " in below will be able to display in mode list.

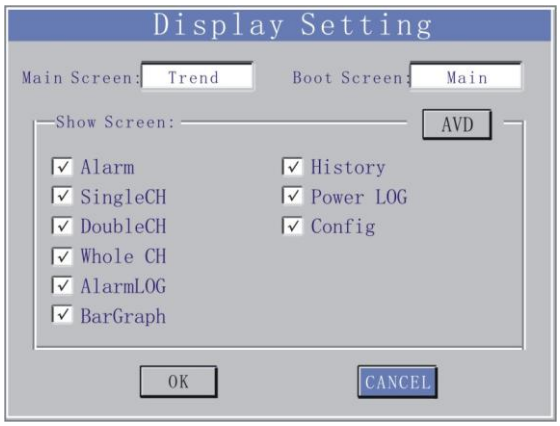


Figure 5-2-13

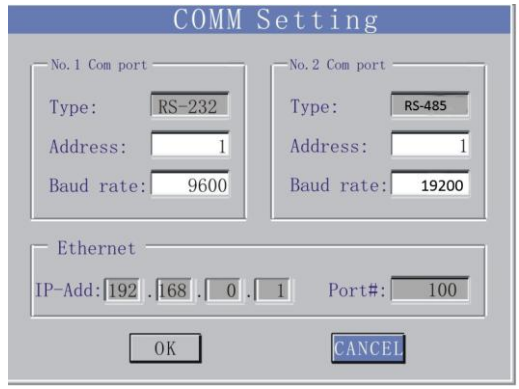


Fig 5-2-14

" ◀ " 、" ▶ " Left/right shift and select display mode

" ▼ " 、" ▲ " Enable /disable display mode

5.2.4 Com port setting

The following settings are included com type, instrument DE #, buad rate selecting, IP address.

NAME	SETTING RANGE	CONTENTS	PRESET VALUE
COMMUNICATION TYPE	RS-232/RS-485	The type of instrument can not be changed after leaving factory	shows in Figure 5-2-26
ADDRESS	0 - 200	The communication address of instrument	1
Communication baud(bps)	1200、2400、4800、9600、19200	Choose the buad rate of data transfer	9600

[*1] The reliable baud rate will be 19200 bps if instrument electro-optical isolation is used.

[*2] Communication port 2, do not use the electro-optical isolation，the max baud rate is 57600bps。

5.2.5 Printing configuration

Print the recording data, curve and printer communication configuration parameter setting. Figure 5-2-15 and 5-2-16. Baud rate setting will be same as addressed communication configuration setting）

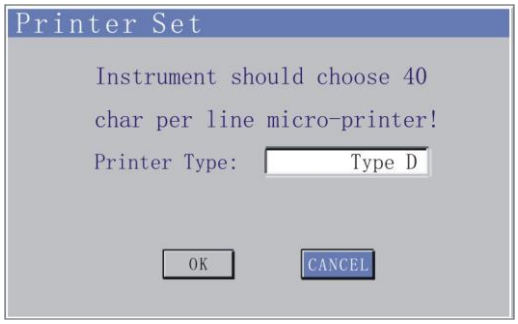


Figure 5-2-15

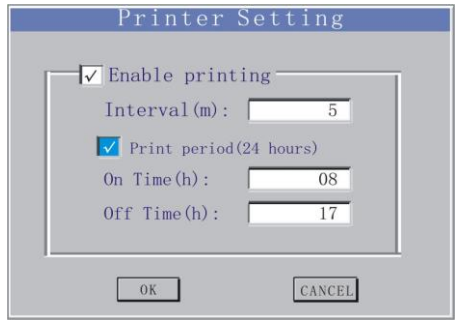
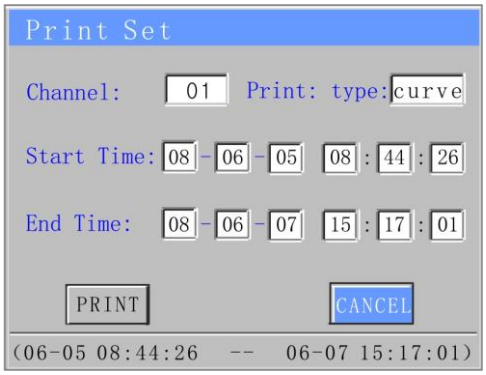
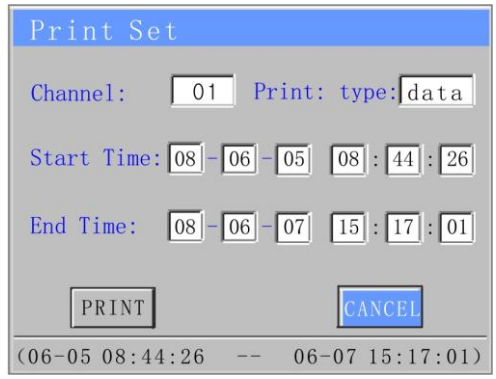


Figure 5-2-16





History trend and data type can be selected. TPμP-A40 micro Pinter is recommended.

5.2.6 PUR management

As Figure 5-2-17 shows:

Purview mamagement is used for instrument password control and number of users. Higher level parameters can only accessed by administrator.

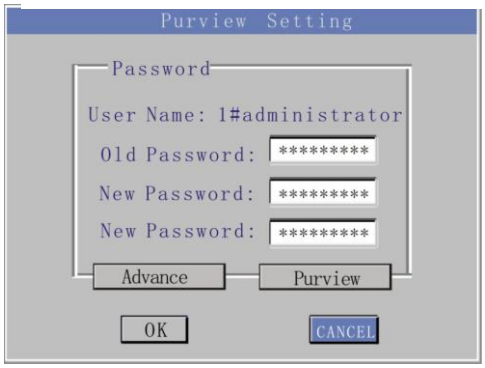


Figure 5-2-17

Figure 5-2-18

- Change password

User can only change their own's password.

- Administrator setting

It provides to advance level user setting. As in Figure 5-2-19,

Name	Setting range	description	Setting
DE #	001 - 200	Instrument com address	001
Buad rate(bps)	1200、2400、4800、9600、19200	Buad rate selected	9600

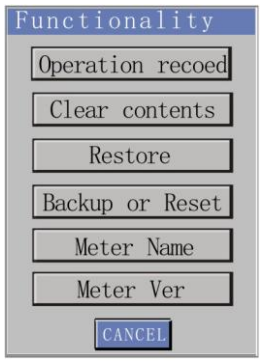


Figure 5-2-19

Figure 5-2-20

1) Figure 5-2-20, click "Operating record display", It will be show as Figure 5-2-21

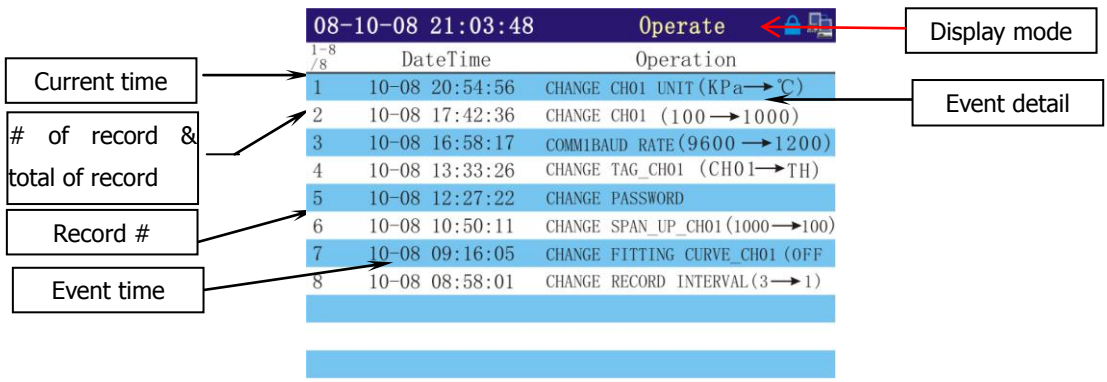


Fig 5-2-21

Note：System can display different mode of events by press F1 if events number is not enough to display in one line.

2) In Figure 5-2-20: It is selectable to click "Disable power On/Off record", " Disable parameter admend"

3) In Figure 5-2-20: If "Limit user operating record" was selected, the record can only be accessed by purviewed user.

Figure 5-2-20: It can reset the instrument's recording data of "curve", "alarm" and "user operating record".

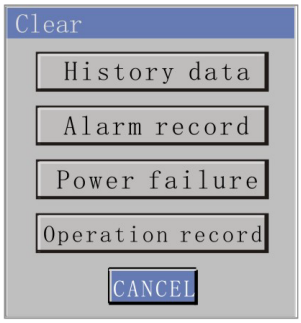


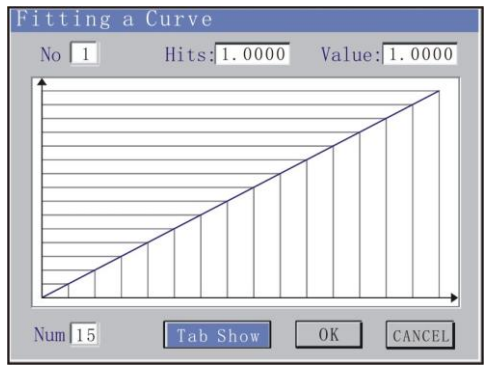
Figure 5-2-20

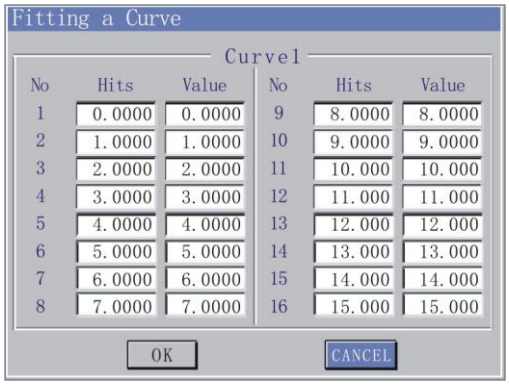
Figure 5-2-22

Figure 5-2-21: the advance administrator can create 3 sets of configuration backup file with referring time. User can restore instrument setting accordingly. The backup parameters can also be reset by pressing CANCEL .

- 1 Administrator setting

It is only "1# administrator" The highest purviewer） can access and change. It include: number of operaters, number of administrators, purview level and recorver initial user password. Figure 5-2-22





Note：The total purview level is 10. "1# adaministrator" (The highest purview's user) can set purview level for others.

5.2.7 Analog output configuration

For analog output instrument, it will display the "analog output" diagram. Figure 5-2-23 and 5-2-24 shows. The analog output V or I value can correspond channel sampling computing or flow rate result. The instrument display will be disable if no function of Analog output. With the function, the maximum channels will be only 8. The analog output will occupy maximum 4 input channel's terminals from 9-12. The parameter refer to below:

Name	Setting range	Description	Factory setting
Analog output	1 - 4	Analog output CH tags	Real value
Output modes	Voltage, Current	Setting the signal mode of linear output	Real value
Sampling CH	NULL、1 - 9	Setting the CH's of linear output. NULL is no output.	NULL
Output range	0 - 20 （mA） 、 0 - 5 （V）	Analog output range setting.(Assume that in the scope to be possible to establish willfully e.g. 2-3V or 0-10mA）	Real value
Corresponding Value type	Sampling、transient flow, instantaneous heat energy.	Analog output corresponding type	Sampling
Corresponding value range	-9999 ——99999	Corresponding CH's value range of linear output（For flow CH, it is the instantaneous flow rate, other's areCH's sampling value）	Sampling measurement
Zero offset	Entire range	Linear output zero offset	0.0000
P offset	Entire range	Linear output proportion offset	1.0000

[Note] Real output signal = Analog output * P offset + Zero offset

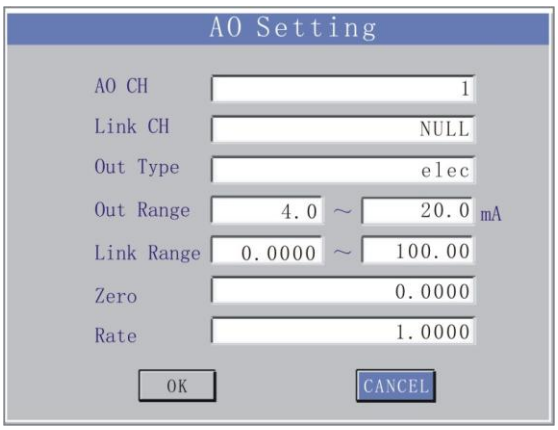


Figure 5-2-23

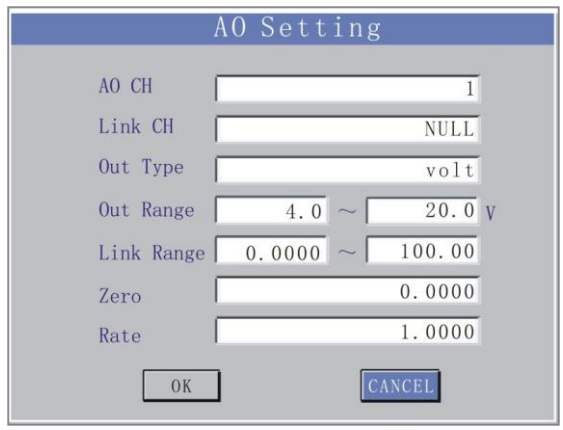


Figure 5-2-24

Note：Maximum of analog output will be 4 CHs. The corresponding CH can be selected from "CH01–CH09". Output mode will be Current (I dc) or Voltage (V dc). "NULL" is not analog output function.

5.2.8 USB Configuration

Recording data format:

ASR is recommended. It can be converte to Xls / CSV format by data analysis software.

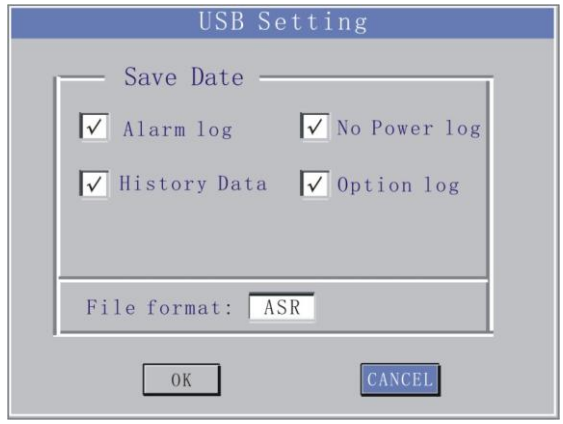


Figure 5-2-25

6 Communication

SWP-ASR100A series will be able to communicate with computer by using RS-232C or RS-485. Either of them is selectable. The SWP-ASR100A series chart recorder management software is ready for user to remoting moniter, configuration setting, data transferring, and profile printing as well

6.1 Communicating connection

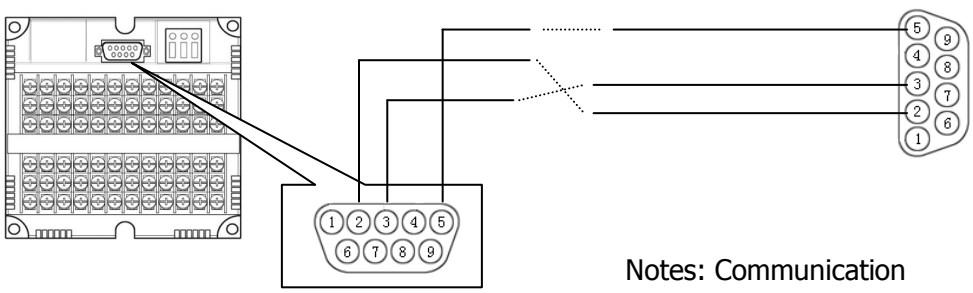


Figure 6-1-0

Notes: Communication connection or disconnection should be under instrument power off condition.

7. Model and suffix code – Ordering information

Model	Spec. code	Additional code	description
ASR101			ASR100 (1 ch)
ASR102			ASR100 (2 ch) (standard configuration)
ASR103			ASR100 (3 ch)
ASR104			ASR100 (4 ch)
ASR105			ASR100 (5 ch)
ASR106			ASR100 (6 ch)
ASR107			ASR100 (7 ch)
ASR108			ASR100 (8 ch)
ASR109			ASR100 (9 ch)
ASR110			ASR100 (10 ch)
ASR111			ASR100 (11 ch)
ASR112			ASR100 (12 ch)
Memory capacity	-1		32 Mb (default)
	-2		64 Mb
	-3		160 Mb
Languages	-0		Simple Chinese
	-1		English
	-2		Traditional Chinese
	-3		Multi-languages
Specification		/C2	RS-232 comm port *1 *2
		/C3	RS-485 comm port *1
		/P(1-6)	No. of DC24V Power outpot
		/AO(1-4)	No. of linear output *3
		/F(1-4)	No. of frequency input *3
		/J(1-12)	No. of (Normally open) Relays
		/JB(1-4)	No of (Normally open/close) relays
		/L	Flow accumulating function (included report function)
		/T	Nutual gas operating function (included report functions)
		/PID	PID control functions

*1. One of /C2、/C3 can be selected，By using μprinter, must be RS-232 (/C2) port available。
*2. TPμP-A40 micro printer is recommended
*3. If analog output or frequency input are selected, the maximum universal inputs number will be 8 (Please refer to manual detail)

e.g.: ASR108-2-1/J4/C2 Instrument dimension is 144×144×240, 8 channels, English revision ASR chart recorder. With 4 relay outputs (normally open) and RS-232 comm port, 64MB internal memory capacity.

Module	Code	Description
SWP-ASR100A-PW	□	Power supply board, 6x DC24V power output（0－6）
SWP-ASR100A-AI	□	Multi-channel isolation board（1－8）
SWP-ASR100A-USB	□	USB Memory（1：64Mb，2：128Mb）

8 Maintainance

In order to ensure the instrument working properly, regular maintanence is necessary.

8.1 Connection inspection

Ensure L、N、G power connection points are tighten.（Grounding resistance must ≤ 100 Ω）

Ensure input signals wiring are properly contacted.

8.2 Operating environment

Operating temperature：0℃—45℃；Humidity：10%—85%（without condensated）;

Please do not use the instrument under direct sunlight, high humidity, corrosive gases and strength electromagnetism conditions.

The front installation panel thickness should be ≥ 4mm

Please install the instrument with carefully.

8.3 Replace spoilt fuse

Steps:

- Ensure power off the instrument
- Disassemble the front panel with 2 screws under front cover.
- Pull out the power board from the rack.
- Replace fuse
- Re-install.
- Power up and check the working status.

8.4 Calibration

Please ensure instrument calibration yearly.

There are some calibration tools recommended:

Standard DC voltage signal generator (Output: 20mV—20V Accuracy ±0.005%);

Variable resistor (Output: 0.1—500Ω Accuracy ±0.001% Resolution 0.001 Ω).

Calibration process:

1 Power up instrument with correct GND, warmup 30 minutes or above;

2 Ensure environments is instrument acceptable condition;

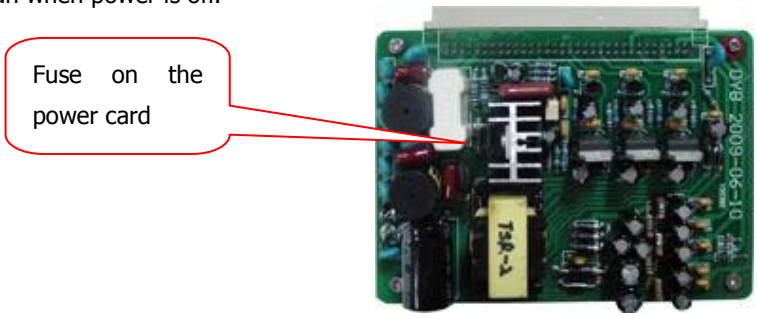
3 Input measurement points (0 ， 50% ， 100%) of measurement range, record down input value Vs measuring value;

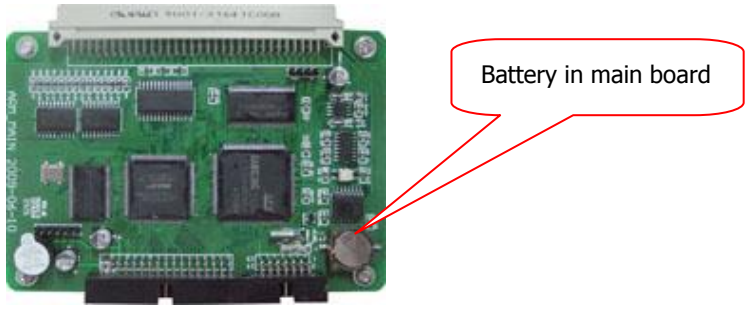
4 Amend zero and P offset value in the instrument according the following formular.

$$\begin{cases} \text{Measuring value}_1 \times \text{Proportion} + \text{Zero} = \text{calibrated value}_1 \\ \text{Measuring value}_2 \times \text{Proportion} + \text{Zero} = \text{Calibrated value}_2 \end{cases}$$

8.5 Change battery

The instrument backup 3.6V battery can be found on mainboard. It need to be replaced if clock dosen't run when power is off.





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