User's Manual

Supmea

Single-loop digital display controller

Supmea

Headquarters

5th floor,Building 4,Singapore Hangzhou Science Technology Park,No. 6 street,
Hangzhou Economic Development Area,Hangzhou 310018,China

Singapore

2 Venture Drive #11-30 Vision Exchange Singapore

info@supmea.com

www.supmea.com

Supmea Automation Co.,Ltd.

Preface

- Thank you for purchasing our product.
- This manual is about the various functions of the product, wiring methods, setting methods, operating methods, troubleshooting methods, etc.
- Please read this manual carefully before operation, use this product correctly to avoid unnecessary losses due to incorrect operation.
- After you finish reading, please keep it in a place where it can be easily accessed at any time for reference during operation.

Note

- Modification of this manual’s contents will not be notified as a result of some factors, such as function upgrading.
- We try our best to guarantee that the manual content is accurate, if you find something wrong or incorrect, please contact us.
- The content of this manual is strictly prohibited from reprinting or copying.

Version

U-HSX5100-MYEN1

Safety Precautions

In order to use this product safely, be sure to follow the safety precautions described.

About this manual

- Please submit this manual to the operator for reading.
- Please read the operation manual carefully before applying the instrument. On the precondition of full understanding.
- This manual only describes the functions of the product. The company does not guarantee that the product will be suitable for a particular use by the user.

Precautions for protection, safety and modification of this product

- To ensure safe use of this product and the systems it controls, Please read carefully the operation manual and understand the correct application methods before putting into operation, to avoid unnecessary losses due to operation mistakes. If the instrument is operated in other ways not described in the manual, the protections that the instrument give may be destroyed, and the failures and accidents incurred due to violation of precautions shall not be borne by our company.
- When installing lightning protection devices for this product and its control system, or designing and installing separate safety protection circuits for this product and its control system, it needs to be implemented by other devices.
- If you need to replace parts of the product, please use the model specifications specified by the company.
- This product is not intended for use in systems that are directly related to personal safety.Such as nuclear power equipment, equipment using radioactivity, railway systems, aviation equipment, marine equipment, aviation equipment and medical equipment.If applied, it is the responsibility

of the user to use additional equipment or systems to ensure personal safety.

- Do not modify this product. The following safety signs are used in this manual:


Hazard, if not taken with appropriate precautions, will result in serious personal injury, product damage or major property damage.


Warning: Pay special attention to the important information linked to product or particular part in the operation manual.

- Confirm if the supply voltage is in consistent with the rated voltage before operation.
- Do not use the instrument in a flammable and combustible or steam area.
- To prevent from electric shock, operation mistake, a good grounding protection must be made.
- Thunder prevention engineering facilities must be well managed: the shared grounding network shall be grounded at is-electric level, shielded, wires shall be located rationally, SPD surge protector shall be applied properly.
- Some inner parts may carry high voltage. Do not open the square panel in the front except our company personnel or maintenance personnel acknowledged by our company, to avoid electric shock.
- Cut off electric powers before making any checks, to avoid electric shock.
- Check the condition of the terminal screws regularly. If it is loose, please tighten it before use.
- It is not allowed to disassemble, process, modify or repair the product without authorization, otherwise it may cause abnormal operation, electric shock or fire accident.
- Wipe the product with a dry cotton cloth. Do not use alcohol, benzine

or other organic solvents. Prevent all kinds of liquid from splashing on the product. If the product falls into the water, please cut off the power immediately, otherwise there will be leakage, electric shock or even a fire accident.

- Please check the grounding protection status regularly. Do not operate if you think that the protection measures such as grounding protection and fuses are not perfect.
- Ventilation holes on the product housing must be kept clear to avoid malfunctions due to high temperatures, abnormal operation, shortened life and fire.
- Please strictly follow the instructions in this manual, otherwise the product's protective device may be damaged.

- Do not use the instrument if it is found damaged or deformed at opening of package.
- Prevent dust, wire end, iron fines or other objects from entering the instrument during installation, otherwise, it will cause abnormal movement or failure.
- During operation, to modify configuration, signal output, startup, stop, operation safety shall be fully considered. Operation mistakes may lead to failure and even destruction of the instrument and controlled equipment.
- Each part of the instrument has a certain lifetime, which must be maintained and repaired on a regular basis for long-time use.
- The product shall be scrapped as industrial wastes, to prevent environment pollution.
- When not using this product, be sure to turn off the power switch.
- If you find smoke from the product, smell odor, abnormal noise, etc., please turn off the power switch immediately and contact the company in time.

Disclaimer

- The company does not make any guarantees for the terms outside the scope of this product warranty.
- This company is not responsible for damage to the instrument or loss of parts or unpredictable damage caused directly or indirectly by improper operation of the user.

Package contents

Serial number	Item Name	Quantity
1	Conductivity sensor	1
2	Manual	1
3	Certificate	1

After opening the box, please confirm the package contents before starting the operation. If you find that the model and quantity are incorrect or there is physical damage in appearance, please contact us.

Content

Chapter 1 Introduction

Single-loop digital display controller with automatic SMD packaging technology, has a strong anti-jamming capability. Designed with dual-screen LED display, it could display more contents. It can be used in conjunction with various sensors、transmitters to display temperature, pressure, liquid level, speed, force and other physical parameters, and to output alarm control, analog transmission, RS-485/232 communication etc. More than the traditional digital display meters is a new function to restore the factory default parameters, with easier operation and better applicability.

Chapter 2 Features

- Double four-digit LED display.
- 10 types of dimensions available
- Standard snap-in installation
- Power supply: AC/DC100~240V (Frequency 50/60Hz) Power consumption≤5W DC 12~36V Power consumption≤3W

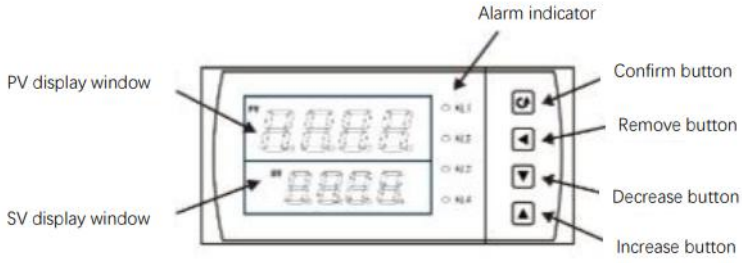
Chapter 3 Parameters

Input				
Input signal	current	Voltage	resistance	Galvanic couple
input resistance	≤250Ω	≥500KΩ		
Maximum input current	≤30mA			
Maximum input voltage limit		≤6V		
output				
output	current	Voltage	Relay	24V power distribution or feedback
Output load capacity	≤500Ω	≥250KΩ	AC220V/0.6 DC24V/0.6A AC220V/3A DC24V/3A	≤30mA

Comprehensive parameter	
accuracy	±0.2%FS
Method	The panel touch the button number settings, the parameter setting value password is locked, set value is permanently saved after power failure.
Display method	Measure range: -1999~9999; 0~100% measurement of the measuring cycle; the working status of the light -emitting diodes displayed
Use environment	Operating temperature（0~50℃）relative humidity: ±85%RH; Avoid strong corrosion of gas
Power supply	AC:100~240V (Frequency 50/60Hz); DC 20~29V

Power consumption	≤5W
structure	Standard card entry
communication	The standard MODBUS communication protocol, RS-485 communication distance can reach 1km. RS-232 communication distance can reach 15 meters. Note: When the instrument is equipped with communication function, the active converter is the best communication converter.

Instrument display panel and function button:



Chapter 4 Constructions

4.1 Dimensions and hole size:

Dimensions/code	Hole Size	Dimensions/code	Hole Size
160*80mm(horizontal)/A	152*76mm	72*72mm(cube)/F	68*68mm
80*160mm(vertical)/B	76*152mm	48*48mm(cube)/H	45*45mm
96*96mm(cube)/C	92*92mm	160*80mm(horizontal)/K	152*76mm
96*48mm/D	92*45mm	80*160mm(vertical)/L	76*152mm
48*96mm/E	45*92mm	96*96mm(cube)/M	92*92mm

4.2 Digital tube:

PV display window: display the measured value; in the parameter setting state, display the parameter symbol

SV display window: display the input division number, alarm value, etc., which can be selected and displayed according to the requirements; in the parameter setting state, the display setting is displayed. set parameter value.

4.3 button:

↺	Confirmation: confirmation after modification of numbers and parameters. Page-turning: parameter setting down bottom. Exit: press and hold for 2 seconds to return to the measurement screen.
◀	Shift: press once the data move one bit to the left Return：press and hold for 2 seconds to return upper-level parameter
▼	Decrease；decrease the number With the print function, display time
▲	Increase: increase the number With the print function, used for manual printing

4.4 Four indicators:

AL1: The first alarm indicator AL2: The second alarm indicator AL3: The third alarm

indicator AL4: The fourth alarm indicator.

Chapter 5 Installation

5.1 standard wiring

Notes for instrument wiring in the field:
PV input (process input)

5.1.1 To reduce electrical interference, the wiring of low-voltage DC signal and sensor input should be kept away from strong current wiring. If this is not possible, use shielded wire and ground it at one point.

5.1.2 Any device connected between the sensor and the terminal may affect the measurement accuracy due to resistance or leakage current. Thermocouple or pyrometer input: The compensation wire corresponding to the thermocouple should be used as an extension wire, preferably with shielding.
RTD (Platinum Resistance) Input: The resistance of the three wires must be the same, and the resistance of each wire cannot exceed 15Ω.
First-level parameter setting
In the working state, press the confirmation button PV display LOC, SV display parameter number; press decrease button and increase button to set, press shift button and hold 2 second can return upper-level parameter, Loc equal to arbitrary parameter can return upper-level parameter.

5.2 power-on setting

After the instrument is powered on, it will enter the self-checking state. After the self-checking is completed, the instrument will automatically enter the working state. In the working state, press the button to display LOC. The LOC parameter settings are as follows:

5.2.1 (1) Loc is equal to any parameter to enter Level 1 menu (LOC=00; no lock when it's 132);

(2) Loc=132, press the ↺ for 4 seconds to enter the second level menu;

(3) Loc=130, press the ↺ for 4 seconds to enter the time setting menu; For the table with printing function;

(4) Loc is equal to other values, press the for 4 seconds to exit to the measurement screen.

5.2.2 If Loc=577, in the Loc menu, press and hold the key and the key simultaneously for 4 seconds, all parameters of the instrument can be restored to the factory default settings.

5.2.3 In any other menu, press the for 4 seconds to exit to the measurement screen.

5.2.4 In the measurement screen, press the and the simultaneously for 4 seconds to modify the alarm value of the first-level parameter

5.2.5 When using thermocouple signal input, when the decimal point of the channel is dP=0, the temperature display resolution is 1°C; when dP=1, the temperature display resolution is 0.1°C.

5.2.6 Time setting

In the state that the PV of the meter displays the measured value, press the to enter the parameter, set LOC=130, and in the state that the PV displays LOC and the SV displays 130, press the for 4 seconds to enter the time parameter setting, and the meter PV displays "dATE" ", SV displays the current date (eg: 090720 - July 20, 2009), in this state, you can refer to the instrument parameter setting method to set the current date. In the current date display state of the instrument, press the , the instrument PV will display "TInE", and the instrument SV will display the current time (such as 183047-18:30:47). In this state, you can refer to the instrument parameter setting method to set the current time. In the current time display state of the instrument, press the again to exit the time setting and return to the PV measurement value display state.

5.2.7 Return to working state

Manual return: In the instrument parameter setting mode, after pressing the for 4 seconds, the instrument will automatically return to the real-time measurement state.

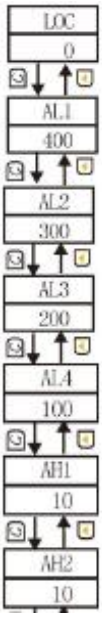
Automatic return: in the instrument parameter setting mode, without pressing any button, the instrument will automatically return to the real-time measurement state

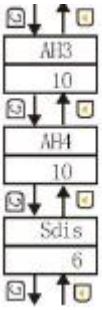
after 30 seconds.

5.3 Parameter setting:

First parameter setting:

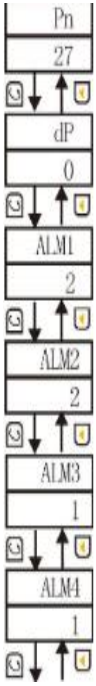
In the working state, press the ↻ PV to display LOC, and SV to display the parameter value: press ▲ or ▼ to set, long press ◀ for 2 seconds to return to the previous parameter, and Loc equals any parameter to enter the first parameter.

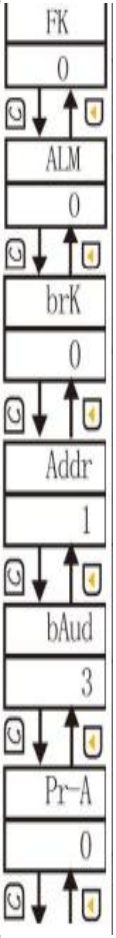
Factory setting	Parameter	Setting range	explanation
	Lo c Set parameter forbidden lock	0~999	LOC=00; no lock LOC≠00,132; lock LOC=132: no lock
	RL 1 First alarm	-1999~9999	First alarm value
	RL 2 Second alarm	-1999~9999	Second alarm value
	RL 3 Third alarm	-1999~9999	Third alarm value
	RL 4 Forth alarm	-1999~9999	Forth alarm value
	RH 1 first alarm return	0~9999	Frst alarm return

	RH 2 Second alarm return	0~9999	Second alarm return
	RH 3 Third alarm return	0~9999	Third alarm return
	RH 4 Forth alarm return	0~9999	Forth alarm return
	5dI 5	0~7	SdiS= 0: SdiS=1:display first alarm SdiS=2:display second alarm SdiS=3:display third alarm SdiS=4:display forth alarm SdiS=5:display time SdiS=6:display ℃ SdiS=7: no display

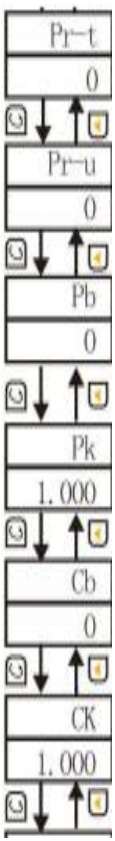
Second parameter setting:

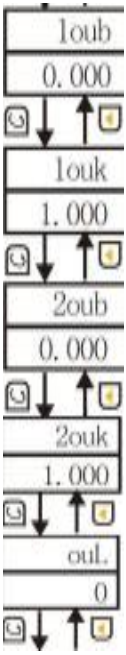
In the working state, press the confirmation button PV display LOC, SV display parameter number; press decrease button and increase button to set, press shift button and hold 2 second can return upper-level parameter, when Loc=132, press confirmation 4 seconds can enter secondary parameter.

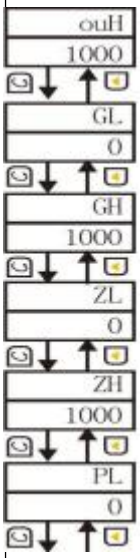
Factory settings	parameter	Setting range	explanation
	Pn Input Pn	0~35	Setting index number type
	dP Decimal	0~3	dP=0: no decimal dP=1: The decimal point is at ten dP=2: The decimal point is at hundred dP=3: The decimal point is at thousand
	ALn1 First alarm	0~2	ALM1=0: no alarm ALM1=1: first alarm is lower limit alarm ALM1=2: first alarm is upper limit alarm
	ALn2 Seco nd alarm	0~2	ALM2=0: no alarm ALM2=1: second alarm is lower limit alarm ALM2=2: second alarm is upper limit alarm
	ALn3 Third alarm	0~2	ALM3=0: no alarm ALM3=1: third alarm is lower limit alarm ALM3=2: third alarm is upper limit alarm
	ALn4 Forth alarm	0~3	ALM4=0: no alarm ALM4=1: forth alarm is lower limit alarm ALM4=2: forth alarm is upper limit alarm ALM4=3: disconnection alarm
	ALG	0~1	ALG=2: No flickering alarm

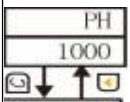
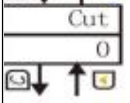


	flickering alarm		ALG=1: flickering alarm
	FL Filter coefficient	0~19	Set the filter coefficient of the meter to prevent the displayed value from jumping
	ALn Alarm function	0~19	Units digit=0: No alarm delay function Units digit=1-9: After the alarm delay (0.5×set value) seconds, tens digit=0: There is an alarm output when the wire is disconnected (relay alarm contact output) tens digit =1: No alarm output when disconnected (Note: When ALM4=3, this function is disabled)
	brL Disconnected display value	0~3	Brk=0: When disconnected, display 0 Brk=1: When disconnected, display the maximum index number Brk=2: When disconnected, display the historical maximum value Brk=3: When disconnected, display the time before disconnection Measurements
	Addr Device number	0~250	Set the device code of the instrument during communication
	bAUd communication baud rate	0~3	Baud=0: The communication baud rate is 1200bps; Baud=1: The communication baud rate is 2400bps Baud=2: The communication baud rate is 4800bps; Baud=3: The

			communication baud rate is 9600bp
	Pr-A alarm printing function	0~1	Pr-A=0: No alarm printing function (without this function, no such parameter) Pr-A=1: With alarm printing function (without this function, no such parameter)
	Pr-t Timed print interval	1~2400	Set the interval time of timing printing (without this function, there is no such parameter)
	Pr-U Print unit	0~45	See the unit setting function code table (without this function, there is no such parameter
	Pb Displays the entered zero shift	Full range	Set the shift amount of display input zero point (see instrument parameter description 3
	PE Displays the input scale ratio	0~1.999	Set the magnification ratio of the displayed input range (see instrument parameter description 3)
	Cb Zero Shift for Cold Junction Compensation	Full range	Set the zero point migration amount of the cold junction compensation (when the thermocouple is input, there is this parameter
	CE Amplification ratio of cold	0~1.999	Set the amplification ratio of the cold junction compensation (when the thermocouple is input, there is this parameter

	junction compensation		
	1oub Zero shift of the first transmission output	0~1.2	Set the zero shift amount of the 1st transmission output (see instrument parameter description 4
	1ouE Amplification ratio of the first transmission output	0~1.2	Set the magnification ratio of the 1st transmission output (see the instrument parameters
	2oub Zero shift of the second transmission output	0~1.2	Set the zero shift amount of the second transmission output (see instrument parameter description 4)
	2ouE Amplification ratio of the second transmission output	0~1.2	Set the magnification ratio of the second transmission output (see instrument parameter description 4)
	oul Lower limit of transmission	Full range	Set the lower limit range of the transmission output

	output range		
	ouH Transmission output range upper limit	Full range	Set the lower limit range of the transmission output
	GL Flashing alarm lower limit	Full range	Set the flashing alarm lower limit range (when the measured value is lower than the set value, the measured value will be displayed and flashed, this function is available when ALG=1)
	GH Flashing alarm upper limit	Full range	Set the upper limit range of the flashing alarm (when the measured value is higher than the set value, the measured value will be displayed and flashed, and this function is available when ALG=1)
	ΞL Light bar display upper limit	Full range	Set the lower limit range value of the light bar display (useful when the light bar meter is used) (see instrument parameter description 5
	S ΞH Light bar display upper limit	Full range	Set the upper limit value of the bar display (useful for bar meter) (see instrument parameter description 5)
	PL Measuring range lower	Full range	Set the measurement lower limit range of the input signal

	limit		
	PH Measurement range upper limit	Full range	Set the measurement upper limit range of the input signal
	CuE Measuring Small Signal Cutoff	0~100%	Set the small signal cutoff amount of the input signal (when the input signal is less than the set percentage, it will be displayed as 0, this function is only valid for voltage and current signals)

Output type table

Pn	Signal type	Measure range	Pn	Signal type	Measure range
0	TC B	400~1800℃	18	Remote Resistance 0～350Ω	-1999～9999
1	TC S	0～1600℃	19	Remote Resistance 30～350Ω	-1999～9999
2	TC K	0～1300℃	20	0～20mV	-1999～9999
3	TC E	0～1000℃	21	0～40mV	-1999～9999
4	TC T	-200.0～400.0℃	22	0～100mV	-1999～9999
5	TC J	0～1200℃	23	-20~20mA	-1999～9999
6	TC R	0～1600℃	24	-100~100A	-1999～9999
7	TC N	0～1300℃	25	0~20Ma	-1999～9999
8	TC Wre3-25	70～2000℃	26	0~10Ma	-1999~9999
9	TC Wre3-25	0～2300℃	27	4~20Ma	-1999~9999
10	TC Wre5-26	0～2300℃	28	0~5V	-1999~9999

11	RTD Cu50	-50.0 ～ 150.0 ℃	29	1~5V	-1999~9999
12	RTD Cu53	-50℃~150℃	30	-5~5V	-1999~9999
13	RTD Cu100	-50℃~150℃	31	0~10V	-1999~9999
14	RTD Pr100	-200~650℃	32	0~10mA square	-1999~9999
15	RTD BA1	-200~650℃	33	4~20Ma	-1999~9999
16	RTD BA2	-200~600	34	0~5V Square	-1999~9999
17	Linear resistance 0～400Ω	-1999℃~9999℃	35	1~5V square	-1999~9999

Unit setting function code table

code	0	1	2	3	4	5	6	7	8	9	10
unit	Kgf	Pa	KPa	MPa	mmHg	MmH_2O	bar	℃	%	Hz	m
code	11	12	13	14	15	16	17	18	19	20	21
unit	t	l	M^3	Kg	J	MJ	GJ	Nm^3	m/h	t/h	l/h
code	22	23	24	25	26	27	28	29	30	31	32
unit			J/h	MJ/h	GJ/h	Nm^3/h	m/m	t/m	l/m	m^3/m	Kg/m
code	33	34	35	36	37	38	39	40	41	42	43
unit	J/m	MJ/s	GJ/m	Nm^3/m	m/s	t/s	l/s	m^3/s	kg/s	L/s	MJ/s
cod	44	45									

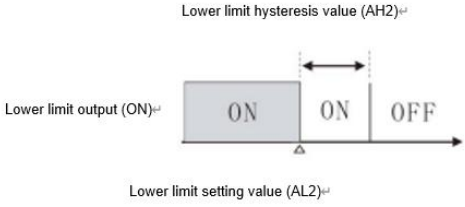
e											
unit	GJ/s	Nm3 /s									

5.4 parameters illustration

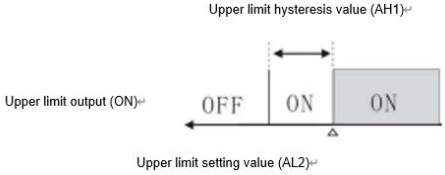
5.4.1 Alarm output (AL1, AL2, AH1, AH2)

★ About hysteresis: The instrument adopts alarm output with hysteresis to prevent the output relay from frequent action when the alarm output critical point fluctuates. The specific output status is as follows:

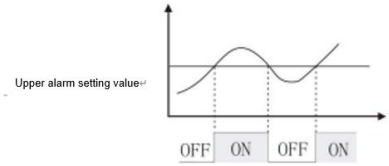
★When the measured value increases from low:



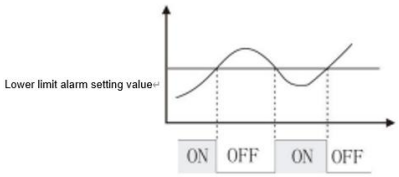
★When the measured value decreases from high:



★Bit-type upper limit alarm output:



★Bit-type lower limit alarm output:



5.4.2 Filter coefficient - the times of sampling, used to prevent the measurement display value from jumping Sampling period - when the analog input is used, the time for each data acquisition by the instrument is 0.5 seconds.

The relationship between the PV display value of the instrument, the filter coefficient and the sampling period is as follows:

For example: when the analog input is used, if the filter coefficient is set to 6 (times), the instrument will automatically average the sampling values within (6×0.5) 3 seconds, Push method to update PV display. (Each display is the sampled average of the first 3 seconds)

5.4.3 display the migration and enlargement of the input:

During regular calibration, Pb and Pk can be adjusted to change the display error of the measured value.

The calculation formula of Pb and Pk: Pk = set display range ÷ actual display range × original Pk

Pb = set display range lower limit - actual display range lower limit × Pk + original Pb

Example: DC current 4 ~ 20mA input to the instrument, measurement range It is -200～1000KPa. Now it is found that -202 is displayed when 4mA is input during calibration, and 1008 is displayed when 20mA is input. (Original Pb=0, original Pk=1.000)

5.4.4 Transmitter output migration 1Oub, 1OuK, 2Oub, 2OuK the transmitter output of the instrument is calibrated at 0~20mA or 0~5V. If you want to change the output

range or adjust the output deviation, you can use the following formula to achieve.

$$\text{new } 0ub = \text{now } 0ub - \frac{\text{Current output lower limit-scheduled output lower}}{\text{Full range}}$$

$$\text{new } 0uk = \text{now } 0uk - \frac{\text{Current input lower limit-scheduled input lower}}{\text{Full range}}$$

In the formula, when the output is a current signal, the full scale = 20mA, and when the output is a voltage signal, the full scale = 5V.

Example 1: Transmitting current 0～20mA output, now want to change to 4～20mA output. During measurement, output zero value output is 0mA, when input full scale, output is 20mA, current Oub=0, current OuK=1

$$\text{new } 0ub = 0 - \frac{0-4}{20} = 0.2 \qquad \text{new } 0uK = 1 - \frac{20-20}{20} = 1$$

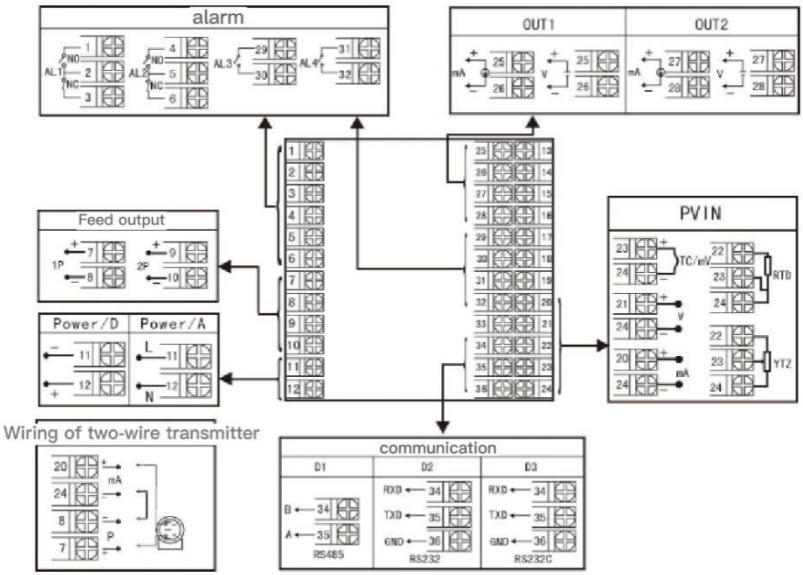
Therefore, set Oub to 0.2, and OuK remains unchanged, and the output from 0~20mA is changed to 4 ~20mA.

5.4.5 Light bar display mode:

Light bar display: If the measurement range is 0~100 and the current measurement value is 50, the light bar display will be fully bright from 0 to 50. Light bar display range: The light bar display range is the percentage of the range set by ZL and ZH. For example:

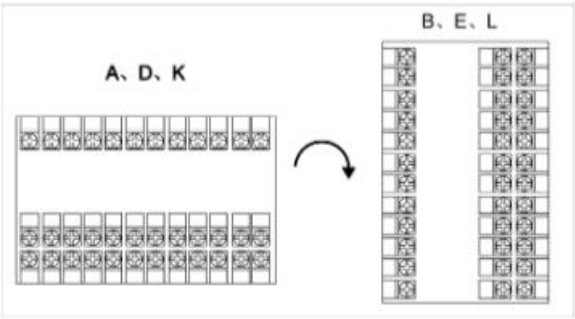
- Set the range to 0～100, the current measurement value is 50, then the light bar display is 50%.
- Set the range to 0～1000, the current measurement value is 500, then the light bar display is 50%.

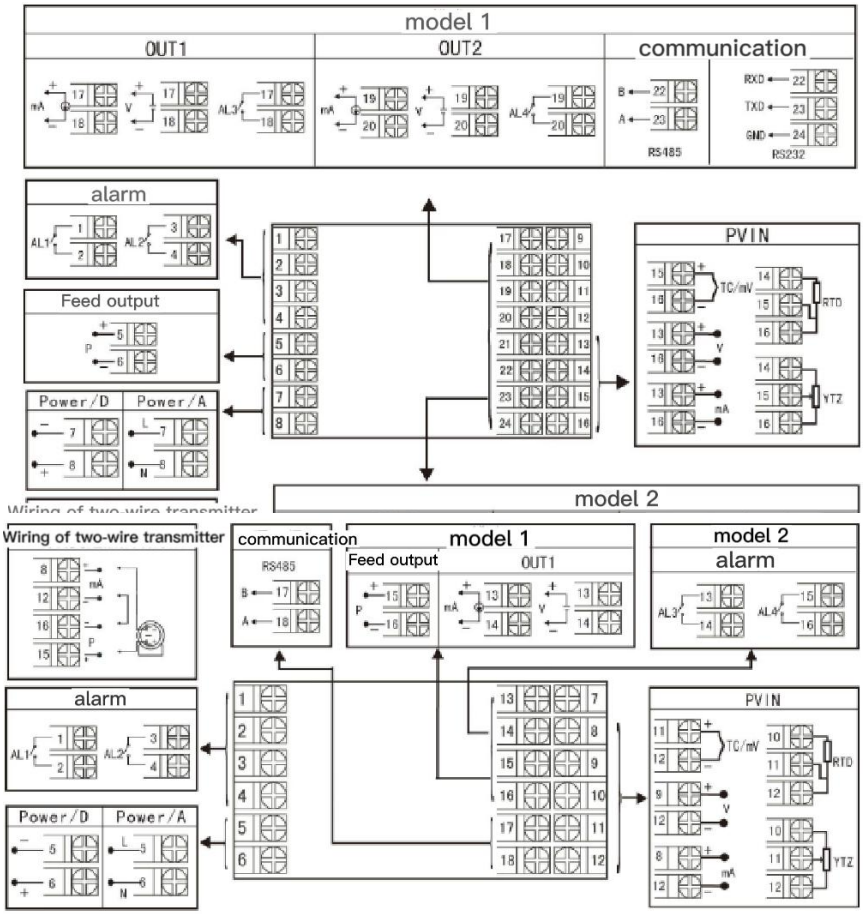
Wiring:



Dimensions are A、B、C、D、E、K、L、M Type.

Note: The direction of the wiring terminals of the rear cover of the horizontal and vertical instruments is different, see the following view.





Wring of dimension H

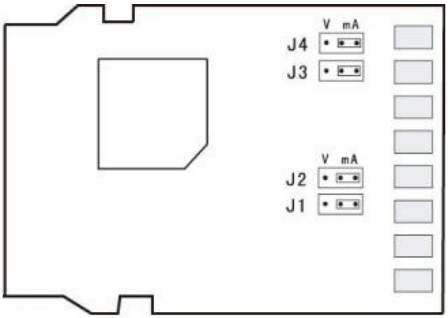
Note: The voltage and current input with the shape code F must be switched through the short-circuit ring

J1, J2 are the switching positions of the first input signal

J3 and J4 are the switching positions of the second input signal

	DC voltage input	AC current input
short circuit status		

The schematic diagram of the motherboard with the shape code F is as follows:



Printing function:

Manual printing:

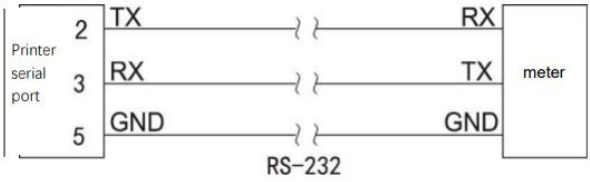
In the display state of the measured value of the instrument, press the ▲ to print out the current real-time measured value.

Timing printing:

When the time measurement is equal to the interval time, the instrument will control the printer to print regularly, and the current timing measurement value will be printed during the scheduled printing. The print format is:

```
------------------------
TIME      PRINT
2009－05－16          ---------- date
09：46：03            ---------- time
PV=  －250℃           ---------- Measured value
Alm：○ ○ ○ ●          ---------- Alarm condition
------------------------
```

Wiring:



The instrument has the function of communication with the upper computer, and the upper computer can complete the functions of automatic adjustment, parameter setting, data acquisition, monitoring and control of the lower computer. Cooperate with industrial control software, under Chinese WINDOWS, it can complete the functions of dynamic picture display, instrument data setting, chart generation, storage record, report printing and other functions. Technical index Communication method Serial communication RS485, RS232 etc. Baud rate 1200～9600 bps Data format One start bit, eight data bits, one stop bit

Chapter 6 Warranty & After-sales Service

We promise to the customer that the hardware accessories provided during the supply of the instrument have no defects in material and manufacturing process. From the date of the purchase, if the user's notice of such defects is received during the warranty period, the company will unconditionally maintain or replace the defective products without charge, and all non customized products are guaranteed to be returned and replaced within 7 days.

Disclaimers:

- During the warranty period, product faults caused by the following reasons are not in the scope of Three Guarantees service
- Product faults caused by improper use by customers.
- Product faults caused by disassembling, repairing and refitting the product.

After-sales service commitment:

- We promise to deal with the customer's technical questions within 2 hours.
- For the instruments returned to the factory for maintenance, we promise to issue the test results within 3 working days and the maintenance results within 7 working days after receiving them.