

SR Series Sensor Display Meter User's Manual



Features :

- Universal input :Tc / RTD / Analog signal
- Various units can be selected
- With display, alarm and current transmit function.
- With RS485 communication function
- Power supply 100-240VAC

For your safty, please read following content carefully before you are using our meter!

■ Safe Caution

※ Please comply with the below important points.

- ⚠ Warning An accident may happen if the operation does not comply with the instruction.
- ⚠ Notice An operation that does not comply with the instruction may lead to product damage.
- ※ The instruction of the symbol in the manual is as below.
- ⚠ An accident danger may happen in a special condition.

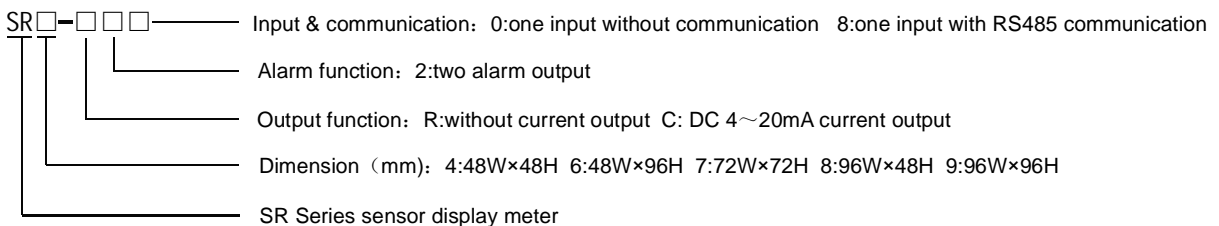
⚠ Warning

1. A safty protection equipment must be installed or please contact with us for the relative information if the product is used under the circumstance such as nuclear control, medical treatment equipment, automobile, train, airplane, aviation and equipment etc. Otherwise, it may cause serious loss, fire or person injury.
2. A panel must be installed, otherwise it may cause creepage (leakage).
3. Do not touch wire connectors when the power is on, otherwise you may get an electric shock.
4. Do not dismantle or modify the product. If you have to do so, please contact with us first. Otherwise it may cause electric shock and fire.
5. Please check the connection number while you connect the power supply wire or input signal, otherwise it may cause fire.

⚠ Caution

1. This product cannot be used outdoors. Otherwise the working life of the product will become shorter, or an electric shock accident may happen.
2. When you connect wire to the power input connectors or signal input connectors, the moment of the No.20 AWG (0.50 mm²) screw tweaked to the connector is 0.74n.m - 0.9n.m. Otherwise the connectors may be damaged or get fire.
3. Please comply with the rated specification. Otherwise it may cause electric shock or fire, and damage the product.
4. Do not use water or oil base cleaner to clean the product. Otherwise it may cause electric shock or fire and damage the product.
5. This product should be avoid working under the circumstance that is flammable, explosive, moist, under sunshine, heat radiation and vibration. Otherwise it may cause explosion.
6. In this unit it must not have dust or deposit, otherwise it may cause fire or mechanical malfunction.
7. Do not use gasoline, chemical solvent to clean the cover of the product because such solvent can damage it. Please use some soft cloth with water or alcohol to clean the plastic cover.

■ Code Illustration



■ Code Structure

Code	Alarm	4~20mA analog current	RS485 communication
SR□-R20	2	without	without
SR□-C20	2	with	without
SR□-R28	2	without	with
SR□-C28	2	with	with

Note: Size 48×48 mm without communication function

■ Main Technical Parameter

1.Parameters of the whole machine

Power supply	100~240V AC/DC
Total current	<30mA (220VAC/50Hz)
Analog output	4~20mA analog current, loading resistance : 600Ωmax
Alarm output	Relay output loading capability: 1A/230VAC
Auxiliary voltage output	DC 24V/30mA
Dielectric Strength	The inter-communal dielectric between supply-side, relay contacts, the signal input terminal higher than 2000VAC 50Hz 1Min
Communication	RS485 communication interface, MODBUSRTU protocol
Panel Protection Level	IP65
Ambient temperature	0~50℃ 45~80RH%
Storing ambient	-10~60℃ 25~85RH%

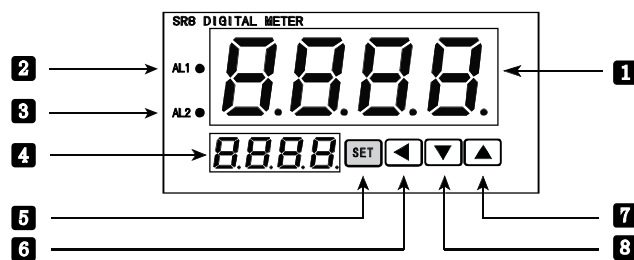
2.Input parameter

S/N	Code	Input type	Measuring range	Resolution	Accuracy	Input impedance
0	℄	K type Tc	-50~1200℃	1℃	±0.5%F.S±3digits	>100KΩ
1	℄	J type Tc	0~1200℃	1℃	±0.5%F.S±3digits	>100KΩ
2	℄	E type Tc	0~850℃	1℃	±0.5%F.S±3digits	>100KΩ
3	℄	T type Tc	-50~400℃	1℃	±0.5%F.S±3digits	>100KΩ
4	℄	B type Tc	600~1800℃	1℃	±0.5%F.S±3digits	>100KΩ
5	℄	R type Tc	500~1600℃	1℃	±0.5%F.S±3digits	>100KΩ
6	℄	S type Tc	-10~1600℃	1℃	±0.5%F.S±3digits	>100KΩ
7	℄	N type Tc	-50~1200℃	1℃	±0.5%F.S±3digits	>100KΩ
8	℄	PT100	-199.9~650.0℃	0.1℃	±0.5%F.S±3digits	(0.2mA)
9	℄	CU50	-50.0~150.0℃	0.1℃	±0.5%F.S±3digits	(0.2mA)
10	℄	CU100	-50.0~150.0℃	0.1℃	±0.5%F.S±3digits	(0.2mA)
11	℄	Linear voltage 0~50mV	0~50mV	1digit	±0.5%F.S±3digits	>100KΩ
12	℄	Linear current 4~20mA	0~20mA	1digit	±0.5%F.S±3digits	<150Ω
13	℄	Linear voltage 0~10V	0~10V	1digit	±0.5%F.S±3digits	>47KΩ
14	℄	Linear resistance 0~400Ω	0~400Ω	1digit	±0.5%F.S±3digits	>100KΩ

3.Unit & Code Table

S/N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Code	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄
Unit	M	cm	mm	kg	g	mg	Mpa	pa	ba	Mba	N	W	KW	RPM	Hz	KHz	mV	V	KV	mA	A	KA	Ω	KΩ	℃	°F

■ Panel Indication

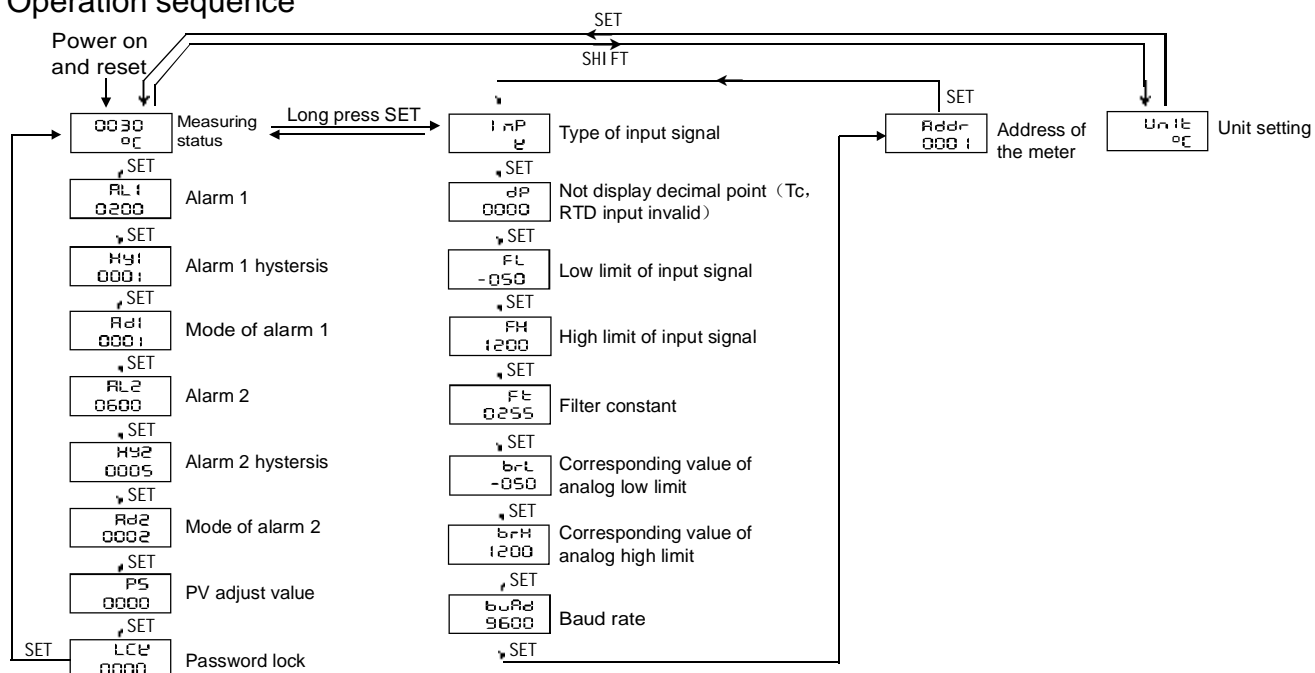


S/N	Code	Name	Illustration
1	LED	PV display window	Display measuring value/setting parameter
2	AL1	1st alarm indicate light	1st alarm indication light (the light on means alarming, and relay will give an action)
3	AL2	2nd alarm indicate light	2nd alarm indication light (the light on means alarming, and relay will give an action)
4	LED	Parameter display window (unit code display)	Display parameter value and unit code
5	SET	SET function key	Parameter select and confirm key, enter/exit menu
6	◀	Menu modifying key (SHIFT)	Modify the parameter value
7	▲	Increase key	Increase key
8	▼	Decrease key	Decrease key

■ Panel Key Operation

- (1) SET key: In measuring status, short press SET key to enter the primary setting menu. Long press SET key to enter the advanced setting menu (long press again can return to measuring status). SET key should be pressed to confirm after each modifying.
- (2) ◀(SHIFT) key: In measuring status, short press ◀ to display unit in the PV window. At this time press ▲ to display: M, cm, mm, kg, g, mg, Mpa, pa, ba, Mba, n, W, KW, RPM, Hz, KHz, mV, V, KV, mA, A, KA, Ω, KΩ, ℄, °F. When input signal is Tc, the unit can just select between ℄ and °F when modifying the menu, short press ◀ key can make the parameter value flick circularly from right to left, when each parameter flicking press ▲ or ▼ to modify the value.
- (3) “▲”, “▼” key: press ▲ to increase the value, press ▼ to decrease the value.
- (4) In setting status, if without any operation for a long time, the meter will return to measuring status.

■ Operation sequence



■ Primary Menu

Parameter name	Indication	Setting range	Ex-factory setting
AL 1	1st alarm value setting	FL - FH	200
HY 1	1st alarm hysteresis	0 - 9999	1
Ad 1	1st alarm mode : 1: absolute value low limit alarm 2: absolute value high limit alarm	1-2	1
AL 2	2nd alarm value setting	FL - FH	600
HY 2	2nd alarm hysteresis	0 - 9999	5
Ad 2	2nd alarm mode : 1: absolute value low limit alarm 2: absolute value high limit alarm	1-2	2
PS	PV measured value adjust	-1999-9999	0
LCK	Password lock, LCK=0001, only alarm value can be modified, LCK=0010, all the parameters couldn't be modified (except for LCK menu).	0-9999	0

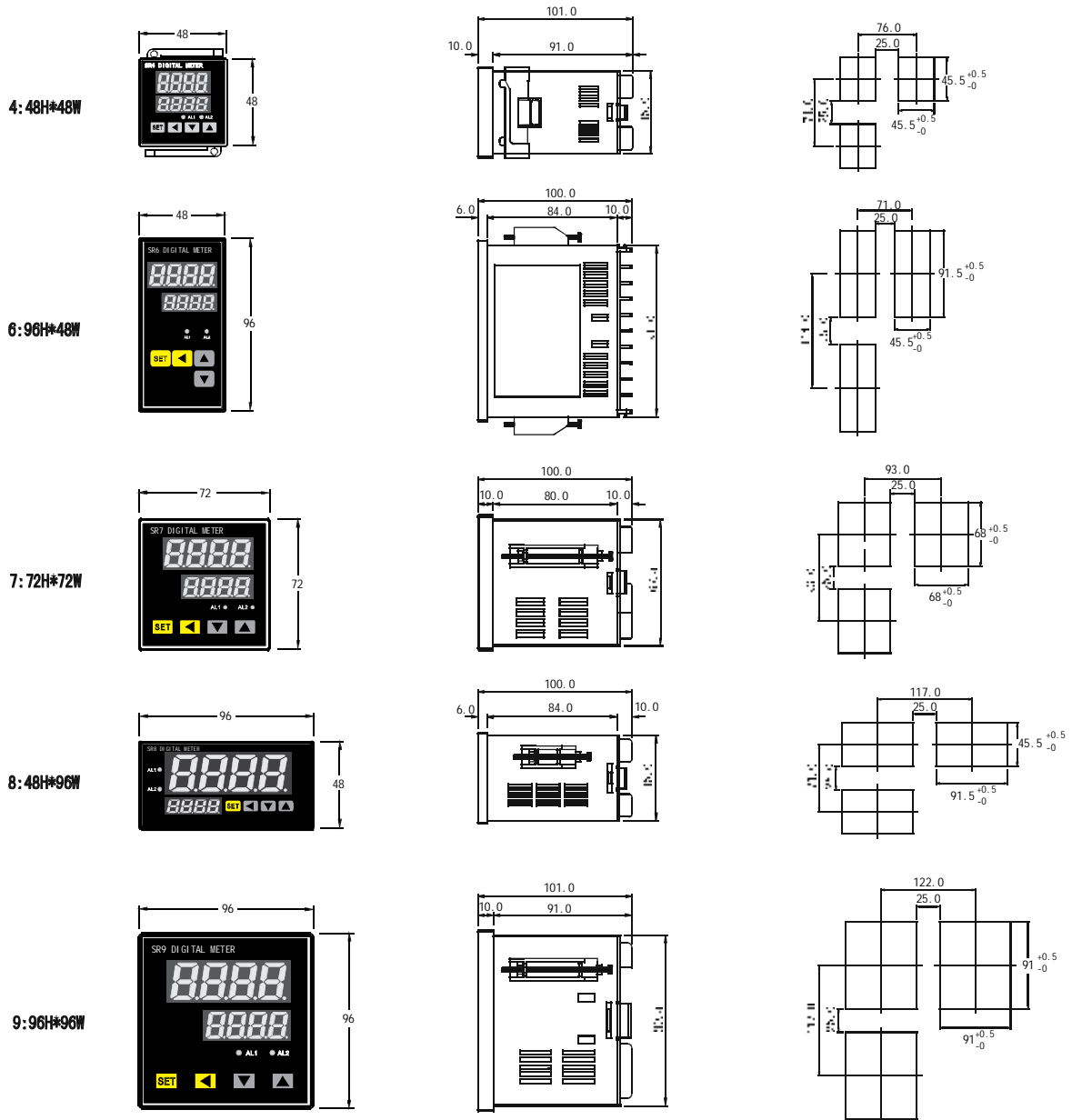
■ Senior Setting Menu

Parameter name	Indication	Setting range	Ex-factory setting
INP	Type of input signal	Refer to input parameter table	K
FL	Display low limit of input signal	Refer to input parameter table	-50
FH	Display high limit of input signal	Refer to input parameter table	1200
dP	Decimal point setting of display value. Valid only for linear-voltage, linear-current and linear-resistance input	0-3	0
Ft	Filter constant, the larger the value is, the slower the display value changes; Instead, it changes faster	0-255	255
brL	Corresponding display value of analog low limit	FL - FH	-50
brH	Corresponding display value of analog high limit	FL - FH	1200
buAd	RS485 communication baud rate	4800, 9600	9600
Addr	RS485 communication address	1-255	1

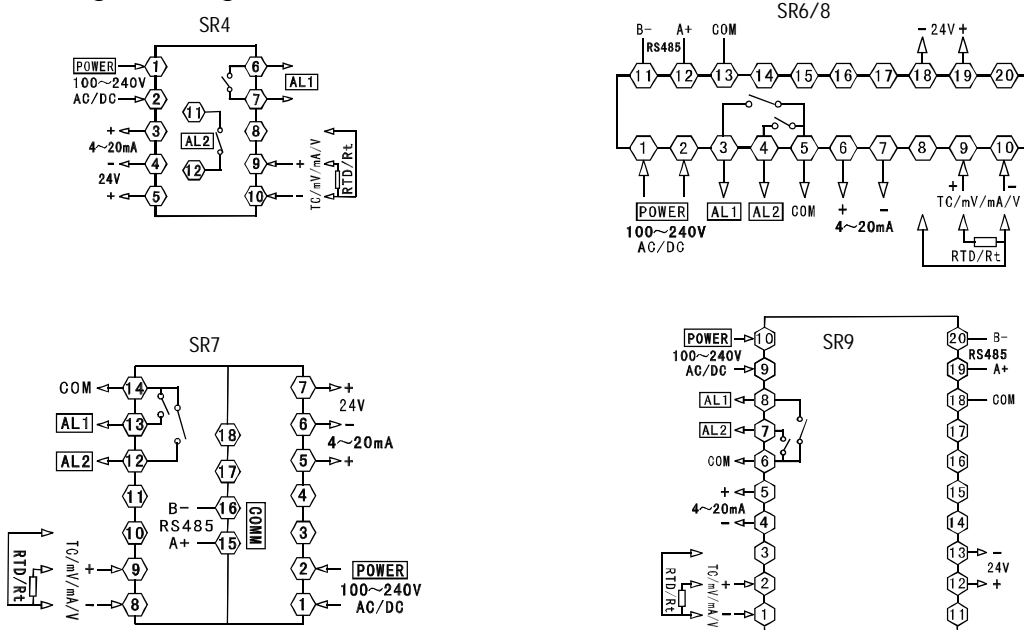
Alarm function table

Alarm code	Alarm mode	Alarm output(AL1 and AL2 are separated to each other)
1	Absolute value low limit alarm	
2	Absolute value high limit alarm	

■ Dimension & Mounting Size



■ Connecting Drawing



Note: Please subject to the connecting drawing on the actual product if any changes

■ Simple Problem Shooting

Display Message	Method
Display HHHH	Input disconnect or over upper limit, please check input signal, FH value and ambient working temperature.
Display LLLL	Input disconnect or under lower limit, please check input signal, FL value and ambient working temperature.

■ Communication Protocol

SR series meter adopts Modbus RTU communication protocol, running RS485 half duplex communication, read function code is 0x03, write function code is 0x10, adopts 16 digit CRC check. The meter does not feedback when CRC error or function code error. Register address range error, the highest bit of function code sets 1 and feedback. Setting data range doesn't check.

Data frame format:

Start bit	Data bit	Stop bit	Check bit
1	8	2	Without

1. Read register

For example, master unit reads float data AL1 (the value is 15.4)

The address code of AL1 is 0x0000, because AL1 is floating data (4 byte), it covers 2 data registers. According to IEEE-754, the standard hexadecimal memory code of decimal float data 15.4 is 0x66667641.

Master unit request (Read multi-register)							
1	2	3	4	5	6	7	8
Meter address	Function code	Start address High bit	Start address Low bit	Data byte length High bit	Data byte length Low bit	CRC code Low bit	CRC code high bit
0x01	0x03	0x00	0x00	0x00	0x04	0x44	0x09

Meter normal answer (Read multi-register)								
1	2	3	4	5	6	7	8	9
Meter address	Function code	Data byte length	Data 1 High bit	Data 1 Low bit	Data 2 High bit	Data 2 Low bit	CRC code Low bit	CRC code high bit
0x01	0x03	0x04	0x66	0x66	0x76	0x41	0xF4	0xE2

2. Write register

For example, master unit writes float data AL1 (setting value is 600)

The address code of AL1 is 0x0000, because AL1 is float data (4 bytes), it covers 2 data registers. According to IEEE-754, the standard hexadecimal memory code of decimal float data 600 is 0x00001644.

Master unit request (Write multi-register)												
1	2	3	4	5	6	7	8	9	10	11	12	13
Meter address	Function code	Start address High bit	Start address Low bit	Data byte length High bit	Data byte length Low bit	Data byte length	Data 1 High bit	Data 1 Low bit	Data 2 High bit	Data 2 Low bit	CRC code Low bit	CRC code high bit
0x01	0x10	0x00	0x00	0x00	0x02	0x04	0x00	0x00	0x16	0x44	0xFD	0xFC

Slave unit answer (Write multi-register)							
1	2	3	4	5	6	7	8
Meter address	Function code	Start address High 8 bits	Start address Low 8 bit	Data byte length High bit	Data byte length Low bit	CRC code Low bit	CRC code high bit
0x01	0x10	0x00	0x00	0x00	0x02	0xC8	0x41

SR series meter address reflection table

No.	Address reflection	Variable name	Type	Byte length	Read / Write allowed	Remark
0	0x0000	1st alarm value AL1	float	4	R/W	
1	0x0001	1st alarm hysteresis HY1	float	4	R/W	Note①
2	0x0002	1st alarm mode AD1	float	4	R/W	
3	0x0003	2nd alarm value AL2	float	4	R/W	
4	0x0004	2nd alarm hysteresis HY2	float	4	R/W	Note①
5	0x0005	2nd alarm hysteresis AD2	float	4	R/W	

No.	Address reflection	Variable name	Type	Byte length	Read / Write allowed	Remark
6	0x0009	Adjustment value PS	float	4	R/W	
7	0x000A	Type of input signal INP	float	4	R/W	Note②
8	0x000B	Low limit of displaying FH	float	4	R/W	
9	0x000C	Hihg limit of displaying FL	float	4	R/W	
10	0x000D	Decimal point DP	float	4	R/W	
11	0x000E	Filter constant setting	float	4	R/W	
12	0x000F	Corresponding value of analog low limit BRL	float	4	R/W	
13	0x0010	Corresponding value of analog high limit BRH	float	4	R/W	
14	0x0012	Unit setting	float	4	R/W	
15	0x0013	Communication baud rate BUAD	float	4	R/W	Note③
16	0x0014	Communication address ADDR	float	4	R/W	
17	0x0015	Lock password setting	float	4	R/W	Note③
18	0x0016	Menu shielding	float	4	R/W	
19	0x0032	Measuring value	float	4		
20	0x0033	Read alarm 1 status	float	4	R	Note①
21	0x0034	Read alarm 2 status	float	4	R	Note①

R:Read only ; R/W:Read/Write

All parameter setting range should refer to user's manual

Note①: Alarm mode

Alarm mode	Low limit alarm	High limit alarm
Value	1	2

Alarm status	ON	OFF
Value	1	0

Note② : Input signal (refer to input parameter table)

Note③ : Code data contrast (refer to unit & code table)

The program of obtaining 16 bytes CRC checking code

```
unsigned int Get_CRC(uchar *pBuf, uchar num)
```

```
{
    unsigned i,j;
    unsigned int wCrc = 0xFFFF;
    for(i=0; i<num; i++)
    {
        wCrc ^= (unsigned int)(pBuf[i]);
        for(j=0; j<8; j++)
        {
            if(wCrc & 1){wCrc >>= 1; wCrc ^= 0xA001; }
            else
                wCrc >>= 1;
        }
    }
    return wCrc;
}
```