

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.

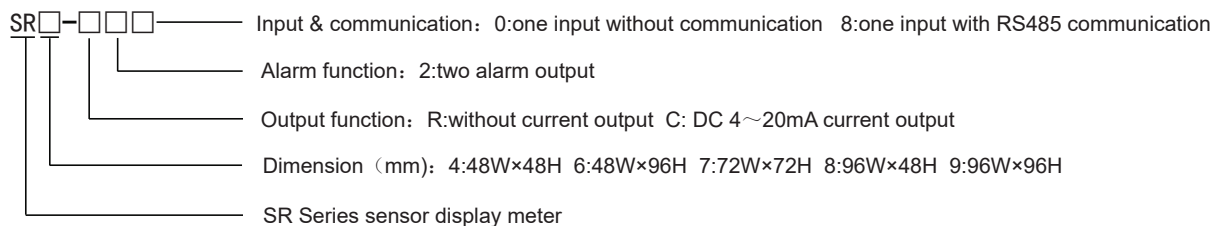
⚠ Warning

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

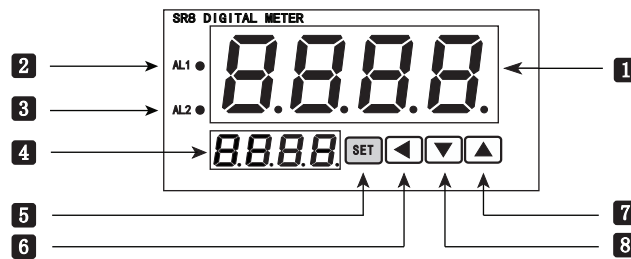
2.Input parameter

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	℃	℄

■ Panel Indication

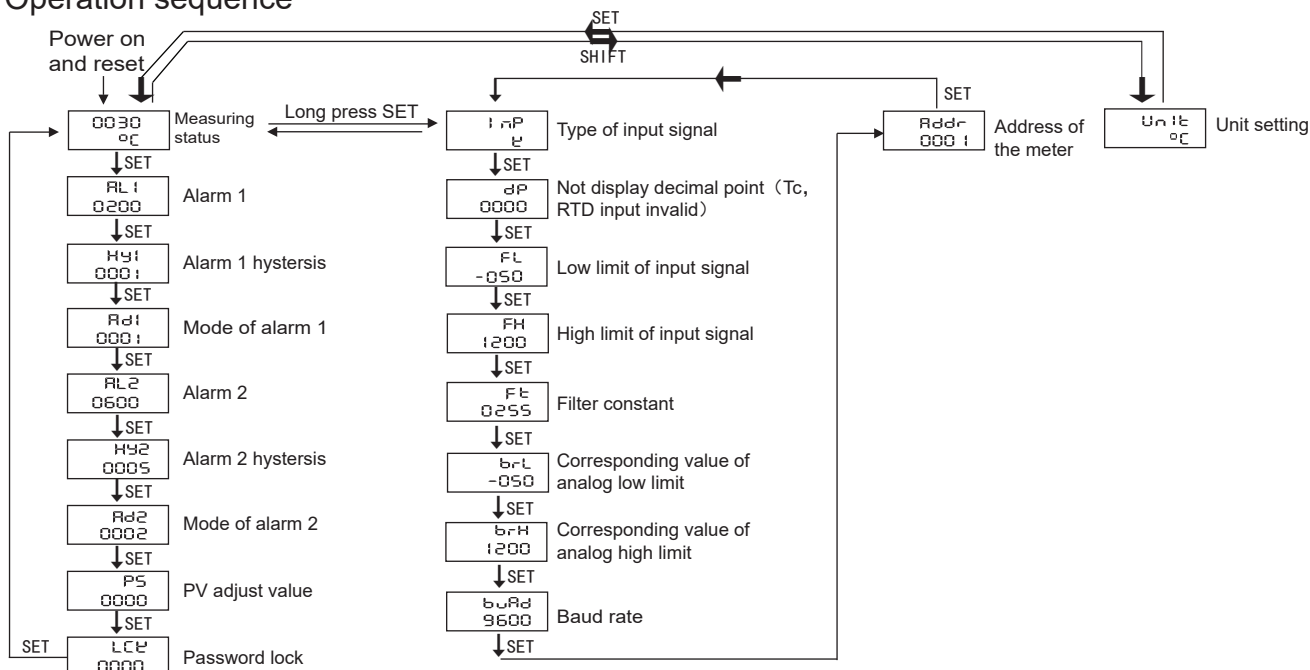


S/N	Code	Name	Illustration
1	LED	PV display window	Display measuring value/setting parameter
2	AL1	1st alarm indicate light	1st alarm indication light (the light on means alarming, and relay will give an action)
3	AL2	2nd alarm indicate light	2nd alarm indication light (the light on means alarming, and 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	◀	Memu 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, ℄, ℄. When input signal is Tc, the unit can just select between ℄ and ℄ 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
AL1	1st alarm value setting	FL - FH	200
HY1	1st alarm hysteresis	0 - 9999	1
Ad1	1st alarm mode : 1: absolute value low limit alarm 2: absolute value high limit alarm	1-2	1
AL2	2nd alarm value setting	FL - FH	600
HY2	2nd alarm hysteresis	0 - 9999	5
Ad2	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

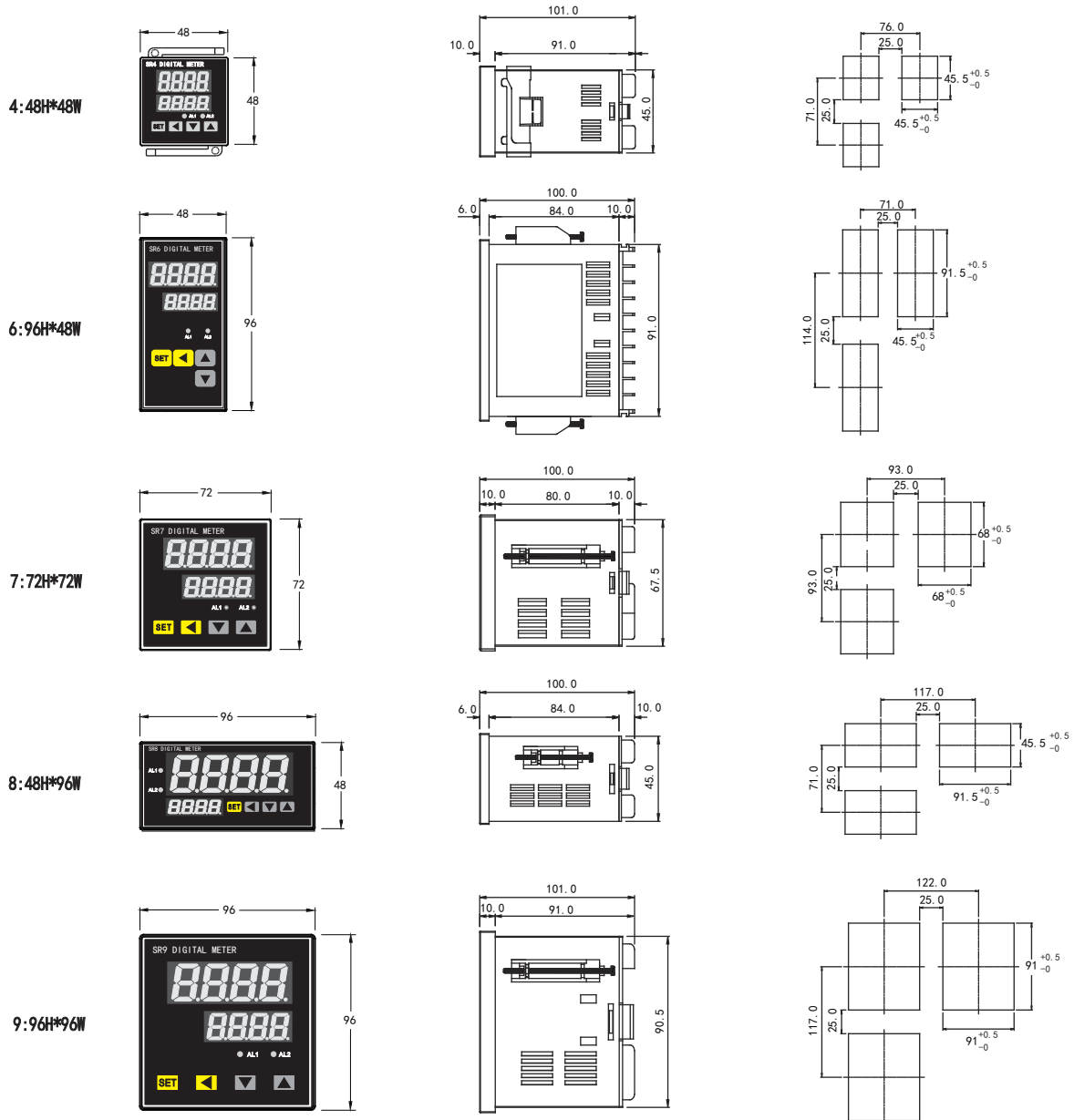
Senior Setting Menu

Parameter name	Indication	Setting range	Ex-factory setting
INP	Type of input signal	Refer to input parameter table	K
FL	Dispaly low limit of input signal	Refer to input parameter table	-50
FH	Dispaly 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

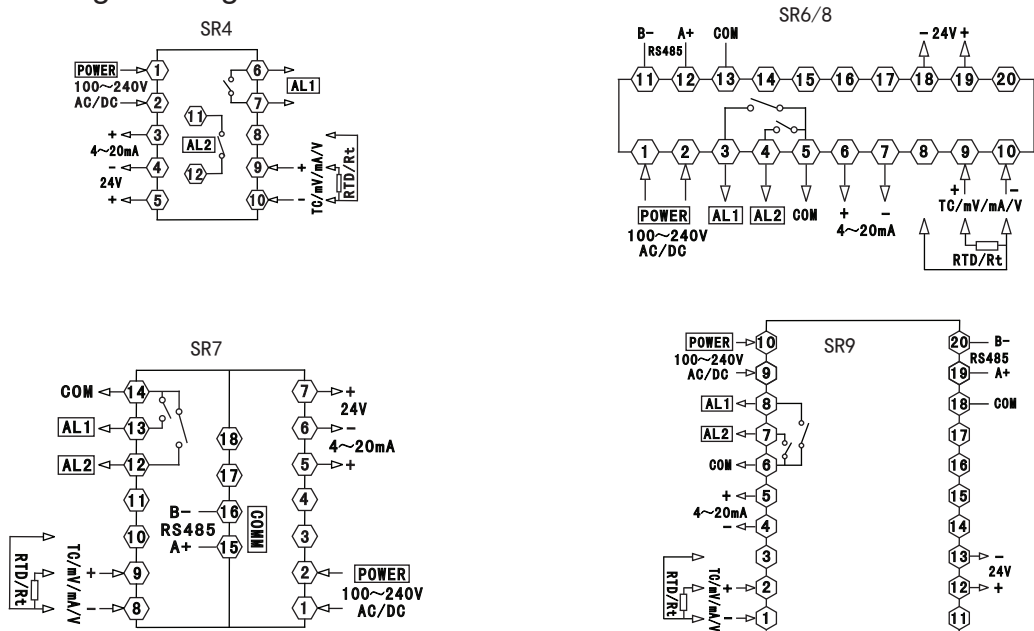
Alarm function table

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 Sensor Meter following Modbus RTU communication protocol, and it can run RS485 half-duplex communication. Read function code is 0x03, write function code is 0x10, 16-bit CRC checking is applied.

Exception handling: the CRC error is not returned, the function number error is not returned, if the register address range is not correct, the highest position 1 of the function number is returned, and the setting data range is not detected.

Data frame format:

Start bit	Data bit	Stop bit	Check bit
1	8	1	None

1. Read register

For example: The host computer read the float number AL1 (the value is 200).

The address code of AL1 is 0x3200, for AL1 is float number (4 bits), it will occupy 2 data registers. Reference IEEE-754 standard the hexadecimal memory code of the decimal floating number 200 is 0x43480000.

Request from the host computer (Read Multi-Registers)							
1	2	3	4	5	6	7	8
Meter Address	Function Code	Start Address High Bit	Start Address Low Bit	Data Length High Bit	Data Length Low Bit	CRC Code Low Bit	CRC Code High Bit
0x01	0x03	0x32	0x00	0x00	0x02	0xCA	0xB3

Correct answer from slave unit (Read Multi-Registers)								
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	0x43	0x48	0x00	0x00	0x6F	0xA1

2. Write register

Example: The host computer write floating point number al1 (setting value 600)

The address code of AL1 is 0x3200, because AL1 is a floating number (4 bytes) and occupies 2 data registers.

The IEEE-754 standard hexadecimal memory code of decimal floating point number 600 is 0x44160000

Request from the host computer (Write Multi-Registers)												
1	2	3	4	5	6	7	8	9	10	11	12	13
	Function Code	Start Address High Bit	Start Address Low Bit	Data Length High Bit	Data 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	0x32	0x00	0x00	0x02	0x04	0x44	0x16	0x00	0x00	0x48	0xFA

Correct answer from slave unit (Write Multi-Registers)							
1	2	3	4	5	6	7	8
Meter Address	Function Code	Start Address High 8 Bit	Start Address Low 8 bit	Data Length High Byte	Data Length Low Byte	CRC Code Low Byte	CRC Code High Byte
0x01	0x10	0x32	0x00	0x00	0x02	0x4F	0x70

SR Series Meter Address Reference Table

No.	Address (Registers number ⑤)	Name	Type	Data Number	Read / Write	Remark
0	0x3000(412289)	Measure Value	float	4	R	
1	0x3002(412291)	read Alarm AL1 status	float	4	R	Note ①
2	0x3004(412293)	read Alarm AL2 status	float	4	R	Note ①
3	0x3100(412545)	Display Low Limit FL	float	4	R/W	
4	0x3102(412547)	Display High Limit FH	float	4	R/W	
5	0x3104(412549)	Input signal type INP	float	4	R/W	Note ②

No.	Address (Registers number ^⑤)	Name	Type	Data	Read / Write	Remark
6	0x3106(412551)	Decimal Point DP	float	4	R/W	
7	0x3108(412553)	Unit Setting	float	4	R/W	Note ③
8	0x310A(412555)	Adjustment value PS	float	4	R/W	
9	0x310C(412557)	Filtering Setting Value FT	float	4	R/W	
10	0x310E(412559)	Analog Low Limit Value BRL	float	4	R/W	
11	0x3110(412561)	Analog High Limit Value BRH	float	4	R/W	
12	0x3200(412801)	Alarm 1 Value AL1	float	4	R/W	
13	0x3202(412803)	Alarm 1 Hysteresis HY1	float	4	R/W	
14	0x3204(412805)	Alarm 1 Mode AD1	float	4	R/W	Note ①
15	0x3206(412807)	Alarm 2 Value AL2	float	4	R/W	
16	0x3208(412809)	Alarm 2 Hysteresis HY2	float	4	R/W	
17	0x320A(412811)	Alarm 2 Mode AD2	float	4	R/W	Note ①
18	0x3300(413057)	Lock Setting	float	4	R/W	
19	0x3302(413059)	Address ADDR	float	4	R/W	
20	0x3304(413061)	Baud Rate BUAD	float	4	R/W	
21	0x3306(413063)	Menu Shield	float	4	R/W	
22	0x3308(413065)	Data transfer sequence DTC	float	4	R/W	Note ④

Note: the address function is reserved in old version. If the old communication protocol is required for data collection in use, please refer to the instructions of the old version.

R: Read Only R/W: Read / Write

For Each Parameter's Setting Range, Please Refer to The Operation User Manuel

Note ① Alarm Mode

Alarm Type	Low Limit Alarm	High Limit Alarm
Reference	1	2

Alarm Status	ON	OFF
Reference	1	0

Note ② : Input Signal (Input parameter meter)

Note ③ : Code and Value reference table (refer to unit code reference table)

Note ④ : DTC communication data transmission sequence description

DTC: □ □ □ — Reserve

— Byte transfer order: When is 0: the transfer order is 1, 2, 3, 4;
When is 1: the transfer order is 4, 3, 2, 1.

— Reserve

Note ⑤: the register number is composed of converting the address to decimal plus 1, and then adding the register identification code 4 in front; For example, the register number of data address 0x3200 is 12800 + 1 = 12801, and then add 4 in front, that is, the register number 412801; Relevant applications can be seen, such as Siemens S7-200 PLC.

※16-bit CRC check code to get C program

```
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;
}
```