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# Pressure Level Transmitter User Manual

PRODUCT DESCRIPTION

YD-2088 diffused silicon pressure transmitter is a high-precision pressure sensor, which uses piezo resistive diffused silicon element as the sensitive element. It has the advantages of small size, light weight, good stability, strong interchangeability and high reliability. It adopts imported diffused silicon or ceramic core as pressure detection element, and is made by special processing technology. It has the characteristics of high precision and good stability. At the same time, the output signal of the diffused silicon pressure transmitter is a unified output signal of 0-10 mA or 4-20 mA, which can be used with various types of moving coil indicators, digital pressure gauges, electronic potentiometers, etc. to achieve accurate measurement and control of pressure.

Diffusion silicon pressure transmitter has a wide range of applications. It is suitable for pressure measurement and control of water vapor, air and other corrosive media in petroleum, chemical and metallurgical industries. It is also suitable for high-voltage switch action current monitoring, flue gas emission monitoring by environmental protection departments, water flow indication of water supply pipe networks of high-rise buildings in building water supply and drainage projects, liquid chemical filtration in pharmaceutical industry, fermentation tanks in food processing industry, boiler water supply systems, air conditioning ducts, oil field water injection, media in pipelines and other occasions requiring continuous measurement.

2. Technical parameters:

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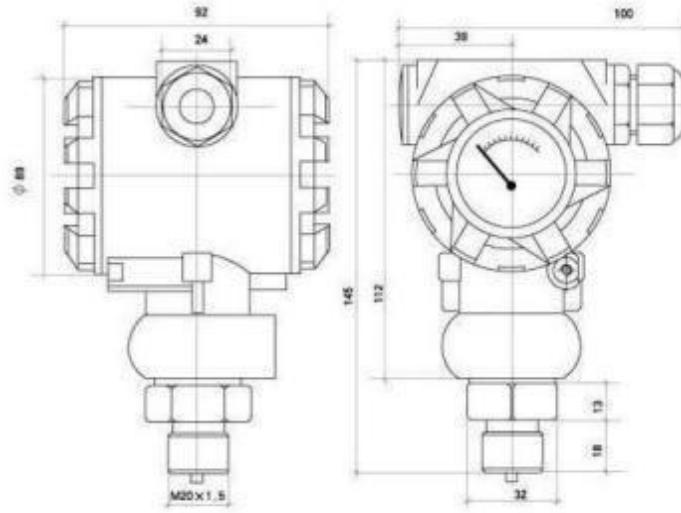3. Schematic diagram of wiring and dimensions

YD-2088A/YD-2088B (current mode):

Dial schematic
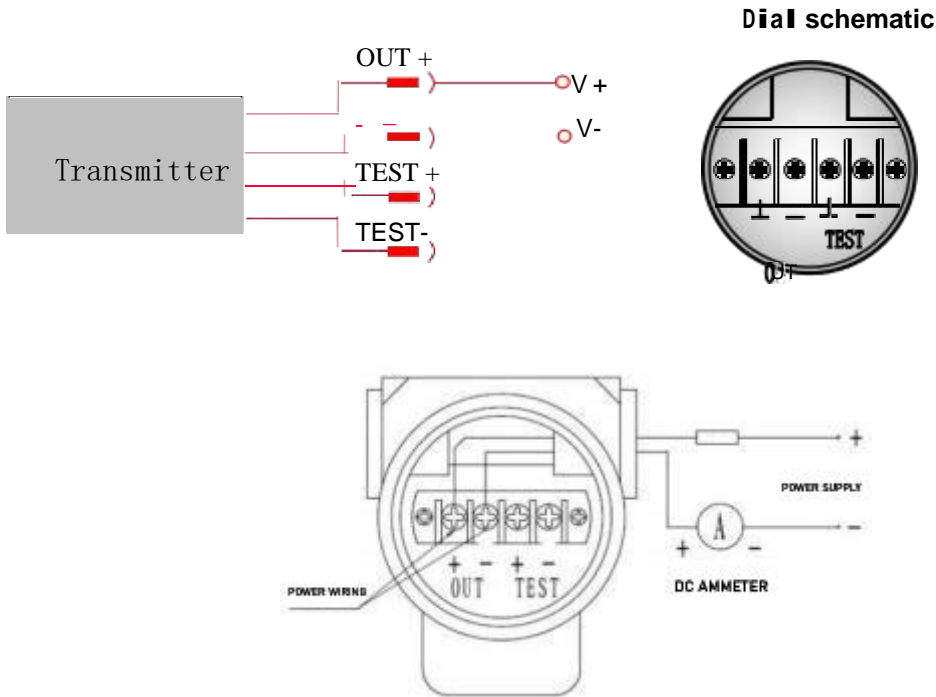
YD-2088C (485 output type):

OUT +	OUT + OUT-Connect DC24V plus/minus (12-30 VDC)
OUT-	
TEXT +	485-A
TEXT-	485-B

YD-2088D (4-20mA+485 output type):

OUT +	OUT + OUT-connect 24V plus or minus
OUT-	(The superimposed current output is a 2-wire current output)
TEXT +	485-A
TEXT-	485-B

Dimension drawing:

4. Function settings （LCD YD-2088A/YD-2088C/YD-2088D）

Key:

Shows:

Main variable clearing

The main variable clearing, that is, PV clearing, is the zero point at relative atmospheric pressure, not the zero point of the sensor range. Place the transmitter directly under atmospheric pressure and long press the "M" key

After more than 5 seconds, you can enter the main variable clearing function. As shown in the figure on the right, "P = 0" is displayed in the menu area. Use the "S" key and "Z" key to select the operation to be performed, and the prompt area will display accordingly:

"NO" will not be cleared by editor-in-chief;

"YES" for editor-in-chief clearing;

"RESET" restores the zero point before the zeroing operation;

If there is no key operation within 30 seconds, the meter will return to measurement mode. This feature is prohibited for use during production and is suitable for use in the field.

The digital tube displays: Zero adjustment: Press and hold the "SET" and ">" keys for five seconds, and the L CD flashes, then the zero adjustment is successful.

Zero-point active migration

Zero-point active migration is to set the current pressure as the zero-point output of the transmitter, apply zero-point pressure to the transmitter, and hold the "Z" key for more than 5 seconds. The instrument will alternately display the current pressure value and the zero-point output current value. As shown in the figure on the right, "LSt" is displayed in the menu area, and the operation to be performed is selected through the "S" key and "Z" key, and the prompt

"NO" does not perform zero-point active migration;

"YES" for zero-point active migration;

If there is no key operation within 30 seconds, the meter will return to measurement mode. This feature is prohibited for use during production and is suitable for use in the field.

Full Point Active Migration

Full-point active migration is to set the current pressure to the full-point output of the transmitter, which is important for

The transmitter applies full point pressure, and long press "S" Key for more than 5 seconds, the meter will alternate

Display the current pressure value and full point output current value, as shown in the right figure, displayed in the menu area

"HSt", use the "S" key and "Z" key to select the operation to be performed, and the prompt area will display accordingly:

"NO" does not perform full-point active migration;

"YES" for full-point active migration;

If there is no key operation within 30 seconds, the instrument will return to the measurement mode. This feature is prohibited from use during production

Function setting

(YD-2088B) Menu 1:

Change the LCD

display

When normal display, long press the S key to switch between current, main variable and percentage, let go when the required display appears; it may jump every 3 seconds, when unwanted variables appear, repeat the above operation once.

Menu 2: Change Units

When normal display, long press Z key, and the 50s on the screen flicker in turn. When the most right bit flashes, let go, press S key, change the number to "00002", press M key once, the lower left corner of the LCD shows the number "2".

Every time you press S, the lower right unit until the required unit appears. press M to save. Menu 3 / 4:, change the range range

When normal display, long press Z key, and the 50s on the screen flicker in turn. When the most right bit flashes, let go, press S key, change the number to "00003", press M key once, and the lower left corner of the LCD shows the number "3".

Press the S key once, the leftmost arrow flashes, press the Z key to shift, and press the S key to change the number. When the rightmost place flashes, press the Z key to illuminate all the decimal points, and press S to select the decimal point position. After the input is completed, press the M key to save the data and automatically switch to the upper limit of the measuring range.

key to skip after entering "3" and directly enter "4") At this time, "4" is displayed in the lower left corner of the LCD. Repeat the above operation, change the number and press the M key to save.

Menu 5: Change Damping

When it is displayed normally, press and hold the Z key, and the five zeros on the screen will flash in turn. When the rightmost position flashes, let go, press the S key, change the number to "00005", press the M key once, and the number "5" will be displayed in the lower left corner of the LCD. Press the S key once, the leftmost arrow flashes, press the Z key to shift, and press the S key to change the number. When the rightmost place flashes, press the Z key to illuminate all the decimal points, and press S to select the decimal point position. Press the M key after entering, save the data and automatically switch to menu 6.

Menu 6: Main variable zeroing

When normal display, long press Z key, and 50s on the screen flicker in turn. When the most right bit flashes, let go, press S key, change the number to "00006", press M key once, the lower left corner of the LCD shows the number "6".

Press the S key, the lower right corner shows the switch between "NO" and "YES", and press the M key to complete when "YES" is displayed

This product is an electronic product. During transportation and use, due to environmental interference and improper use of human operation, the instrument may not work and display normally. For simple faults, users can troubleshoot them themselves, while other faults need to be returned to the manufacturer for maintenance. The following list suggests troubleshooting methods.

1. There is no font on the screen, check whether it is reversed.

2. The remote display does not match the instrument display. Check whether the instrument range and the remote range correspond. 3. The font is non-digital or ink leaks. If the LCD screen is damaged by cracks, return it to the factory for repair.

4. The display jumps randomly under atmospheric pressure, and the sensor is damaged and returned to the factory

5. The pressure measurement display jumps randomly, there is external interference, the instrument is grounded or the interference source is eliminated

7. Installation precautions

1. Before installing the digital display meter on the equipment, check whether the meter head and measuring hole are clean. Keep the tubing clean during use.

2. After the installation is completed, confirm whether the measuring range matches the pressure range to avoid pressure overload or too low resolution.

3. On-site use conditions should meet the requirements of the technical parameters of this instrument. Select the instrument range correctly. The measured pressure cannot exceed the upper and lower measurement limits of the instrument, and a sufficient overpressure safety margin should be left.

4. The temperature of the measured medium shall not exceed the working temperature range of the instrument. When used in corrosion and vibration places, the sealing and vibration resistance of the instrument should also be ensured.

5. The instrument is directly installed vertically downward and can be directly installed on the pressure interface of the pipeline being measured. During installation, avoid the formation of "closed pressure" between the connecting thread of the instrument and the valve in front of the meter (observe the indication value and pay attention to the pressure response time). If this pressure is formed, it should be eliminated in time, otherwise it will cause damage to the measuring components and leakage of the medium.

The sensor and display processing part of this product adopt an integrated design structure, which is easy to use. The instrument and the mechanism under test are directly connected by thread, and there is no requirement for the placement angle of the instrument. Before using the measurement, the approximate pressure range of the measured target should be estimated to avoid mechanical damage to the sensor due to excessive pressure beyond the measurement range. The pressure response time of this product is 0.1 S

8. Environmental precautions

1. The liquid receiving part of the instrument is made of stainless steel metal material and diffused silicon sensor. The medium for measuring strong acid and strong alkali should be a diaphragm digital pressure gauge. This product uses non-rechargeable batteries, and the used batteries should be properly disposed of (can be mailed back to our factory for unified treatment) to avoid environmental pollution.

2. When used at high or low temperature (greater than 85 ° C, less than-30 ° C), a radiator should be added when the temperature exceeds 85 ° C, otherwise the measurement accuracy cannot be guaranteed, and the lithium battery is in danger of explosion when the temperature is too high. You should also pay attention to the instrument temperature during storage or transportation.

3. Since this product is an electronic product when used in a strong electromagnetic field, the instrument will fail, resulting in inaccurate

Indication or inability to display at all, but it will not cause essential damage to the instrument. Different instruments have different pressure measurement ranges. Under normal circumstances, they can be used within 10% of the measurement range. Further use beyond the measurement range may cause mechanical damage to the sensor, thereby causing the leakage of measurement gas or liquid. This damage cannot be recovered, and our factory does not bear any consecutive liability for the consequences caused therefrom.

IX. Preservation and transportation

1. After unpacking, first check whether the instruction manual, accessories, and certificates are complete, determine whether the specifications are consistent according to the ordering requirements, and check whether the outside of the instrument is intact.

2. Read the instruction manual carefully before installation, and calibrate the instrument according to the technical indicators.

3. Install and use in strict accordance with the requirements of the instruction manual.

4. Products that have passed the inspection are not allowed to replace or modify electronic components or adjust parameters at will.

5. The product should be stored in a warehouse at (-20 ~ 60) ℃, relative humidity less than 85%, ventilated, dry, and free of corrosive gases.

6. The product is packed in the same package as the certificate and instruction manual. Strong collision is strictly prohibited during transportation.

10. Ordering instructions and technical services

1. When ordering, users need to provide pressure measurement range, accuracy level requirements, and installation thread requirements in order to select a suitable

Appropriate product specifications.

2. When the product itself cannot operate normally due to quality problems, our company will be responsible for free repair or replacement within one year.

3. In order to ensure that users repair and maintain the purchased products, our company provides users with various accessories for a fee.

11. . Detailed communication explanation (new model: LCD display dual output (current + RS485) corresponding model: YD-2088D)

This protocol complies with the MODBUS communication

protocol and adopts the subset RTU mode in the MODBUS protocol.

RS485 semi-duplex working mode.

1) Serial data format:

Serial port setting: no / odd / parity, 8 bit data, 1 bit stop bit.

Example: 9600, N, 8,1 meaning: 9600 bps, no check, 8 bit data bit, 1 bit stop.

The serial port port rate supported by this transmitter is:

1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

CRC check: 0 xA 001.

The communication protocol of the BS-17 can transmit either a symbolic shaping number or floating point type data.

2) Communication format:

Symbol shaping output:

A. Send the read command format:

address	FC	Data start (H)	Data start (L)	Number of data (H)	Number of data (L)	CRC16 (L)	CRC16 (H)
0X01	0X03	0X00	0X00	0X00	0X01	0X84	0X0A

B. Return to the read data format: for example

address	FC	DL	data (H)	data (L)	CRC16 (L)	CRC16 (H)
0X01	0X03	0X02	0X00	0X01	0X79	0X84

C. Write the command format (06 function code) for example

address	FC	Data start (H)	Data start (L)	data (H)	data (L)	CRC16 (L)	CRC16 (H)
0X01	0X06	0X00	0X00	0X00	0X02	0X08	0X0B

D. Return to the read data format: for example

address	FC	Data start	Data start	data	data	CRC16	CRC16

		(H)	(L)	(H)	(L)	(L)	(H)
0X01	0X06	0X00	0X00	0X00	0X02	0X08	0X0B

3) Abnormal response returns

address	FC	exception code	CRC16 (L)	CRC16 (H)
0X01	0X80 + function code	0x01 (illegal function) 0x02 (illegal data address) 0x 03 (illegal data		

4)) Significance of commands and data supported by plastic data:

FC	Data offset (10 pr)	data number	byte	data area	Directive meaning
0x03 Functional code reads the data					
Range of shaping reads					
0x03	0	1	2	1-255	Read from machine address
0x03	1	1	2	0-1200 1-2400 2-4800 3-9600 4-19200 5-38400 6-57600 7-115200	Porter rate read
0x03	2	1	2	No check for the ODD EVEN	No check Odd check even check

0x03	3	1	2	Kpa Mpa Ma%	pressure unit

				Inh2o Fth2o MmH2O MmHg PSI Bar Mbar Kg/cm2 Pa Torr Atm Empt y M Cm Mm inHg mHg Mh2O ℃	
0x03	4	1	2	0-#### 1-###.#2 -##.##3- #.###4- #.####	The decimal points represent 0 - 4 decimal points, and the decimal position can adjust the resolution shown.
0X03	5	1	2	0-30	Filter coefficient
0x03	6	1	2	0-Current display 1-Pressure display The 2-percentage is shown	Home Screen Display Mode

0x03	7	1	2	0-Not shown	Pay screen display mode

				1- Display temperature	
0x03	8	1	2	0-Linear output 1-Open output	Current output mode

Plastic surgery data users need to enumerate the complete

Floating-point read range

FC (16 Input)	Offset address (10 pr)	word number	Byte number	data area	remarks
0x03	20-21	2	4	0-20.000	Theoretical current output
0x03	22-23	2	4	-19999-99999	Pressure output (primary variable output)
0x03	24-25	2	4	-19999-99999	Principal variable offset values
0x03	26-27	2	4	-19999-99999	Change the delivery range low point
0x03	28-29	2	4	-19999-99999	Change the amount of high
0x03	30-31	2	4	-19999-99999	Sensor range lows
0x03	32-33	2	4	-19999-99999	Sensor range high point
0x03	42-43	2	4	0-1.00000	Gain coefficient of the principal variables
0X03	181-182	2	4	-40-120℃	Internal temperature sensor

Above is the range of the floating-point read data

0x06 The function code is required to write the data

0x06	0	1	2	1-255	Overwrite the from-machine address

0x06	1	1	2	0-1200 1-2400 2-4800 3-9600 4-19200 5-38400 6-57600 7-115200	Modify the Porter rate
0x06	2	1	2	No check	Modify the communication verification mode

				ODD EVEN	
0x06	24-25	2	4	-19999-99999	Zero-bit offset value. Pressure output value = calibration measurement value + zero-bit offset value
preserve					
0x06	65535	1	2	Save to user area	

Refer to the provisions in the MODBUS-RTU protocol for multibytefloating point transmission.

Example of the read pressure command: (hex)

Tx:01030016000225 CF

01 slave address, 03 function code, 0016 offset
address, 0002 read words.Rx:010304 BE40E61215A2

01 slave address, 03 function code, 04 bytes, BE40 E612 is the floating point number of IEE754.

Note the data input in the differentiation protocol, such as offset

address 22 (10 in), 16 in 16.

Communication details (only RS485 output, including digital tube and LCD display corresponding model: YD-2088C)

one. summary:

This protocol complies with the MODBUS communication protocol and

adopts the subset RTU mode in the MODBUS protocol. RS485 semi-

duplex working mode.

two. Serial data format:

 Serial port setting: no check, 8 bit data, 1 bit stop bit.

 Example: 9600, N, 8,1 meaning: 9600 bps, no check, 8 bit data bit, 1 bit stop.

The serial port port rate supported by this transmitter is:

1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

CRC check: 0 xA 001.

In the process of data communication, all the data is processed according to the double-byte plastic data. If the data identifies the floating point number, the writing needs to read the decimal point to determine the size of the data.

three. Communication format:

1. Read the command format (03 function code) for example

A. Send the read command format:

address	FC	Data Start (H)	Data Start (L)	Number of data (H)	Number of data (L)	CRC16 (L)	CRC16 (H)
0X01	0X03	0X00	0X00	0X00	0X01	0X84	0X0A

B. Return to the read data format: for example

address	FC	DL	data (H)	data (L)	CRC16 (L)	CRC16 (H)
0X01	0X03	0X02	0X00	0X01	0X79	0X84

2. Write the command format (06 function code) for example

address	FC	Data Start (H)	Data Start (L)	data (H)	data (L)	CRC16 (L)	CRC16 (H)
0X01	0X06	0X00	0X00	0X00	0X02	0X08	0X0B

B. Return to the read data format: for example

address	FC	Data Start (H)	Data Start (L)	data (H)	data (L)	CRC16 (L)	CRC16 (H)
0X01	0X06	0X00	0X00	0X00	0X02	0X08	0X0B

3. Abnormal response was returned

address	FC	exception code	CRC16 (L)	CRC16 (H)
0X01	0X80 + function code	0x01 (illegal function) 0x02 (illegal data address) 0x03 (illegal data		

four. Supported commands and commands and data meanings:

The list of MODBUS-RTU protocol commands is as follows:

Register name	Data Type	Register address		Check Number of devices	Register Type	Remark
		DEC	HEX			

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				Quantity		
Slave address	Unsigned integer	0	0x0000	1	Read/write	Value range: (1 ~ 255)
Baud rate	Unsigned integer	1	0x0001	1	Read/write	Value range: (0 ~ 7) 0-1200; 1-2400; 2-4800; 3-9600; 4-19200; 5-38400; 6-57600; 7-115200
Unit	Unsigned integer	2	0x0002	1	Read/write	Value range: (0 ~ 14) 0 Mpa / 7 mmH2O 1 KPa / 8 Kgf/cm2 2 Pa / 9 m 3 bar / 10 mm 4 mbar / 11 ℃ 5 PSI / 12 ℉ 6 mH2O
Places of decimal places	Unsigned integer	3	0x0003	1	Read/write	Value range: (0 ~ 4) 0-#####; 1-####.#; 2-###.##; 3-##.### ; 4-#.####;
Measurement Output	Signed integer	4	0x0004	1	Read Only	Value Range: (-19999 ~ 32767)
Range zero	Signed integer	5	0x0005	1	Read Only	
Full point of measuring range	Signed integer	6	0x0006	1	Read Only	
Floating point output	Single precision floating point type	7 / 8	0x0007 / 0x0008	2	Read Only	Single precision floating point number

Instrument status	Unsigned integer	9	0x0009	1	Read Only	0: pressure; 1: Temperature
Check digit	Unsigned integer	10	0x000A	1	Read/ Write Verification	Value range: (0 ~ 2) 0: No verification 1: Even check

						2: Odd check
Data size side	Unsigned integer	11	0x000B	1	Read/ Write Verification	Value range: (0~1) (Note: valid only for measured output values, other registers) 0: Big end mode (high byte in front) 1: Small end mode (low bytes in front)
Zero-bit offset value	There is a symbolic type	12	0x000C	1	Read / write verification	Numerical range: (-19999~32767)
Filter coefficient	Unsigned type	13	0x000D	1	Read / write verification	Numerical range: (0~4)
gain factor	There is a symbolic type	14	0x000E	1	Read / write verification	Numerical range: (-19999~32767)
user facility	Unsigned type	15	0x000F	1	write only	0000H: Save the user data 0055H: Zero to zero 00 AAH: To restore the factory settings 2020H: Advanced user modification enables 0x96 BC: Save factory data
Floating-point zone (compatible with older versions)						
Principal variable output	Single precision floating point	22 / 23	0x0016 / 0x0017	2	read only	
Zero- bit offset value	Single precision floating point	24 / 25	0x0018 / 0x0019	2	read only	Single precision floating point number

		26	0x001A			
Quota zero point	Single precision floating point	27	0x001B	2	read only	
Quota full point	Single precision floating point	28	0x001C	2	read only	
		29	0x001D			
user facility	Unsigned type	655 35	0xFFFF			0000H: Save the user data 2020H: Advanced user modification enable 0055H: zero zero 00 AAH: To restore the factory settings

1. Communication- related parameters, address, baud rate, check bit, take effect immediately after modification, and switch- related parameters are modified

After that, the save instruction needs to be sent to take effect.

2. When modifying the address, the data is also replied with the address before the modification. After the reply, the transmitter address will be automatically modified.

3. Save and restore the factory command will return the original value, indicating that the transmitter has accepted the command from the host.

4. When restoring factory data, pay attention to the fact thatt he parameters saved by the factory may be inconsistent with those saved by the user, so the address, baud rate and calibration data may be inconsistent, so the transmitter must bes earched again after restoring the factory parameters.

5. There are only 3 pieces of data that users are allowed to modify, namely address, address, baud rate, and zero-bit offset value.

6. Generally, users are not allowed to modify the calibration data of the transmitter. If you need to calibrate or change it,p lease contact our company to request the transmitter calibration software. Users sending commands to modify the calibration data themselves will cause the transmitter to outputa bnormal command codes. If you need to modify the calibration data, please use our companys calibration software.

7. This agreement stipulates that all data is communicated in shaped data. For example, the main variable data is 6.000 MPa, three decimal places, and the read data is 6000. Then operations must be performed based on the position of the decimal point to get 6.000. For example, if the decimal point is 3, it means 6000/10 (3), which is 6000 divided by the third power of 10, andth e data of 6.000 is obtained.

6. Examples of commonly used commands: (The example data is all hexadecimal, and the transmitter address is 1)

1. Read the main variable data:

A. Send instruction: 010300040001C5 CB

B. Return data: 010302000A38 43 (0x000A is the read main variable value)

2. Read the number of decimal places:

A. Send instruction: 010300030001740A

B. Return data: 0103020003 F845 (0x0003 is the number of decimal places)

3. Read the transmitter address:

A. Send instruction: 010300000001840A

B. Return data: 01030200017984 (0x0001 is the read transmitter address)

4. Read the transmitter baud rate:

A. Send instruction: 010300010001 D5 CA

B. Return data: 0103020003 F8 45 (0x0003 is the baud rate of the read transmitter. It can be seen from the data description list that the baud rate is 9600)

5. Modify the transmitter address: (the original address of the transmitter is 0x01, modified to 0x02)

A. Send instruction: 010600000002080B

B. Return data: 010600000002080 B (0x0002 is the modified transmitter address)

6. . Modify the baud rate of the transmitter: (The original baud rate of the transmitter was 9600, modified to 4800)

A. Send instruction: 01060001000259 CB

B. Return data: 01 06 000 1000259 CB (0x0002 means to modify the baud rate of the transmitter. It can be seen from the data description list that the baud rate is 4800)

Note: After modifying the command, you must send the command to save to the user area, otherwise the modified data after the transmitter is powered down will be lost because it is not saved.

The command to save to user area is as follows: Save command code after the address is changed from 1 to 2

A. Send instruction: 0206000F0000 B9C9

B. Return data: 02 06 00 0F0000 B9C9 (0x000F is the save function code, 0x0000 means save to the user arE

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