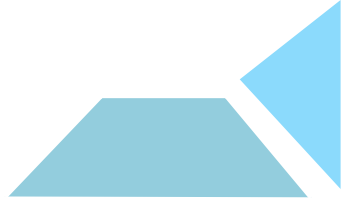




User Manual

RS485/Analog Output Noise Sensor



Chapter I Product Overview

1.1 Introduction

Noise sensor is a new type of integrated sensor, which can obtain the value of water temperature concentration in the environment of the equipment through the acquisition equipment.

1.2 Product description

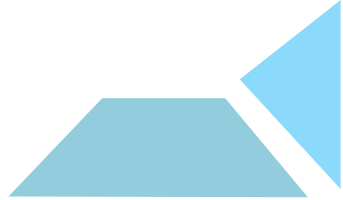
The noise sensor is mainly designed according to the requirements of the national standard GB / T 3785.1-2010 electroacoustic sound level meters Part 1: specifications and the International Standard IEC 61672-1:2002 for class 2 x sound level meters. It is mainly used for on-site real-time measurement of environmental noise, traffic noise, workplace noise, construction noise and social life noise.

1.3 Sensor characteristics

30 ~ 120dba wide range, 20 ~ 12.5khz wide frequency measurement. High performance pre polarized back electret condenser microphone is adopted, which has wide dynamic range and stable performance.

1.4 Applicable scenarios

On site real-time measurement of environmental noise, traffic noise, workplace noise, construction noise and social life noise.



Chapter II Product Introduction

2.1 Product Appearance

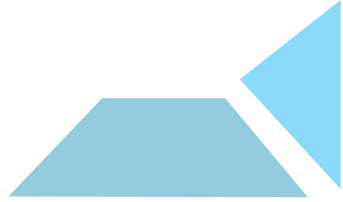


2.2 Power Supply

The user provides the equipment with a DC power supply with an input of 9 ~ 18V. We can use the 220VAC to DC power supply provided by us, or use 12V solar panel and battery for power supply to meet the needs of different occasions.

2.3 Main Product Parameters

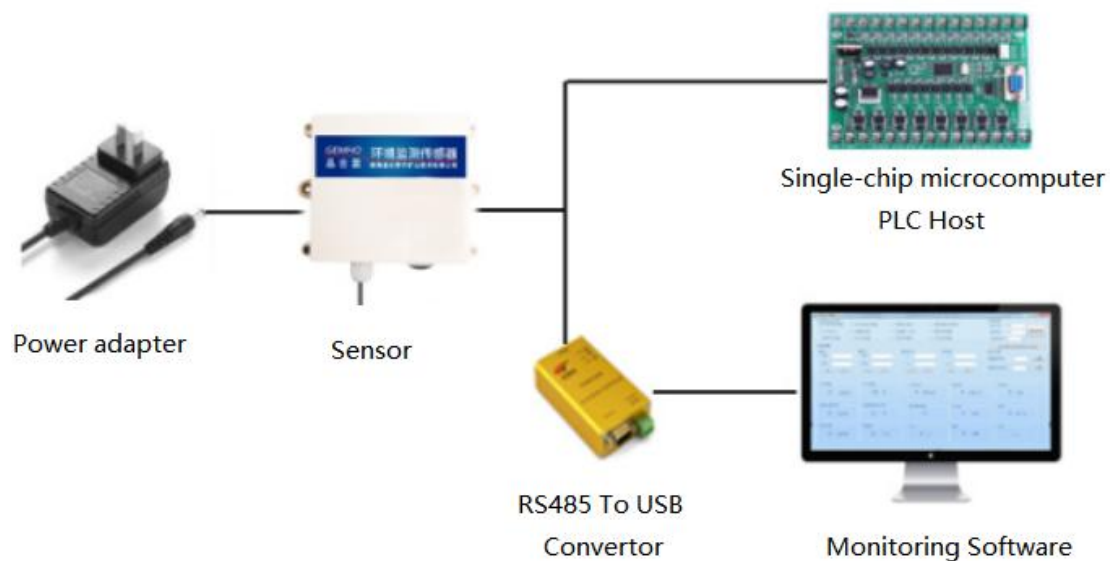
Index	Parameter
Power Supply	9-18VDC
Output Signal	RS485/0-5V/0-10V/4-20mA
Measuring Range	30dB~120dB
Stability	<2%
Accuracy	±0.5dB
Response Time	Fast mode: 500ms, Slow mode:1.5s
Influence of dust cover	≤0.5dB of 50~115db
Dimension	72mm*45mm*15mm
Working Temperature	5°C~45°C
Working Humidity	15%RH~90%RH
Working Pressure	Atmospheric Pressure± 10%
Protection Grade	IP67



Chapter III System Architecture

3.1 RS485 Output Signal

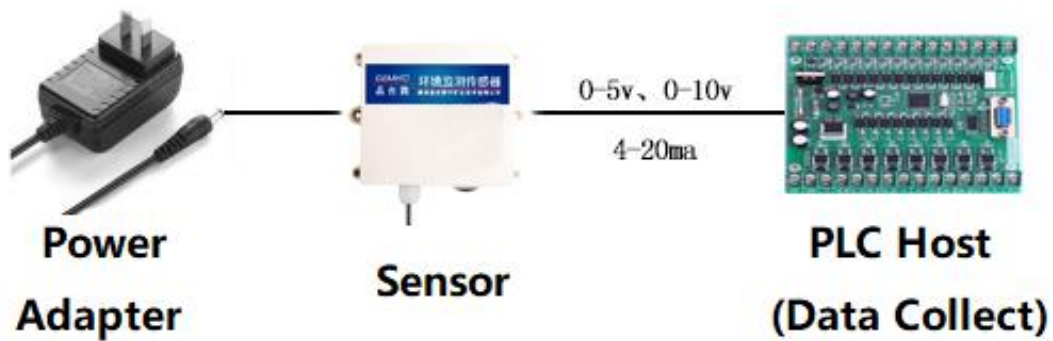
The sensor is powered by 12V DC power supply and connected to PLC with RS485 interface. It can also be connected to MCU through RS485 interface chip. The MCU and PLC are programmed through the Modbus protocol specified later. Or use USB to RS485 to connect with the computer, and use the sensor configuration tool provided by our company for configuration and testing. Theoretically, one bus can connect more than 16 RS485 sensors. If more RS485 sensors need to be connected, RS485 repeaters can be used to expand more RS485 devices.



3.2 Analog Signal Out

Using 12V DC power supply, the sensor can be connected with acquisition equipment such as PLC or single chip microcomputer. Through the measured voltage or current value, the real-time data

collected by the sensor can be obtained.



Chapter IV Installation And Wiring Instructions

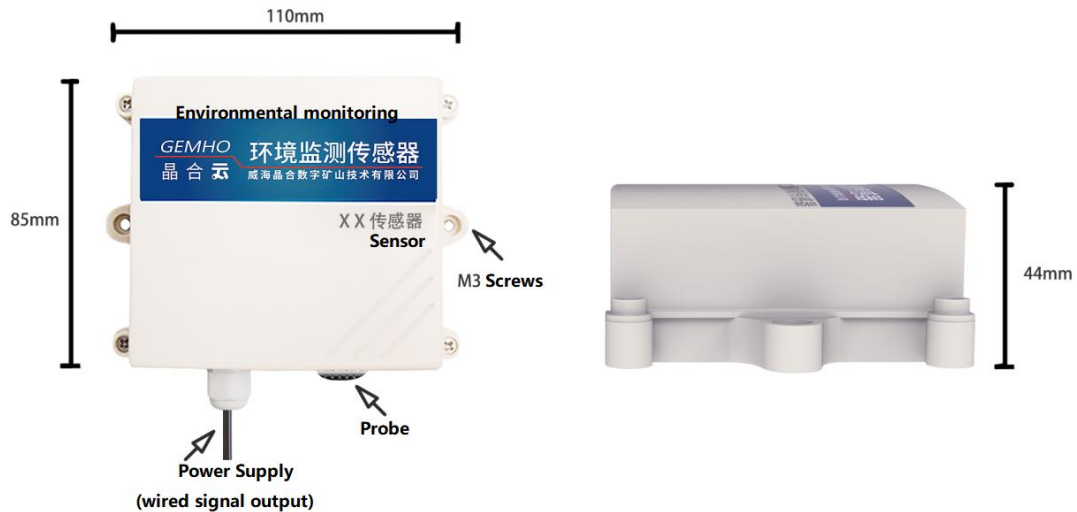
4.1 Equipment List

- 1PCS NPK Sensor
- Product Certificate, Warranty Card And Manual
- Power Adapter (optional)

4.2 Installation Instructions

The equipment adopts wall mounted installation design.

Installation openings are reserved on both sides and can be vertically fixed on the wall through m3 screws or expansion screws.



4.3 Wiring Instructions

(1) RS485 Wire Description

	Line Name	Line Color
Power Supply	Positive power supply	Red
	Negative power supply	Black
Output Signal	RS485A	Green
	RS485B	Yellow

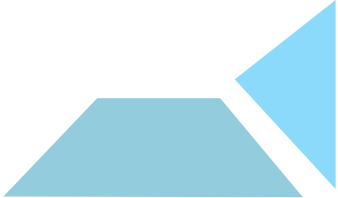
(2) Analog Wire Description

	Line Name	Line Color
Power Supply	Positive power supply	Red
	Negative power supply	Black
Output Signal	Current / voltage output	Green
	Without	Without

Be Careful:

Please follow the wiring instructions strictly, otherwise it is easy to cause excessive current and damage the equipment.

If the power adapter is not purchased in our company, it is equipped with



4-core wire, and the customer needs to prepare 9-18vdc power supply by himself.

For customers who have purchased power adapters from our company, we will connect the DC female head to the equipment before the equipment leaves the factory. After receiving the product, the customer can plug in directly to supply power to the equipment.

Chapter V RS485 Communication Protocol And Host Computer Configuration

5.1 RS485 Communication Protocol And Description

Parameter	Content
Coding	8 bit Binary
Data bit	8-bit
Parity bit	Without
Stop bit	1-bit
Error Check	CRC (redundant cyclic code)
Baud Rate	9600 bit/s

5.2 Data frame format definition

Adopt Modbus-RTU communication protocol, the format is as follows:

Initial structure ≥ 4 bytes of time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

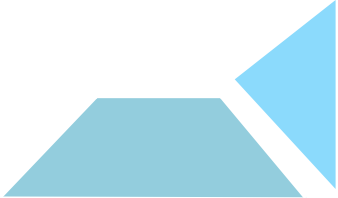
End structure ≥ 4 bytes of time

Address code: the address of the transmitter, which is unique in the communication network (factory default 0x01).

Function code: The instruction function of the command sent by the host. This transmitter only uses function code 0x03 (read register data).

Data area: The data area is the specific communication data. Note that the 16-bit data high byte is in front!

CRC code: 2-byte check code.



(1) Read Noise value of device address 0x01

Inquiry Frame:

Address bytes	Function bytes	Register Start Address	Register Length	CRC Low	CRC High
0x01	0x03	0x00,0x0e	0x00,0x01	0xE5	0xC9

Answer Frame:

Address bytes	Function bytes	Data bytes	Noise Data	CRC Low	CRC High
0x01	0x03	0x02	0x02 0xC1	0x78	0xB4

02C1(hexadecimal)Converted to decimal=705=>Value of Noise=705*0.1(Sensor Resolution)70.5dB(Sensor Unit)

(2) Query device address

Reading the current device address can only be completed independently by a single offline sensor.

Example of querying equipment address:

Send: FF 03 00 0f 00 01 A1 D7

Return: FF 03 01 00 60

The data returned by the sensor 0x01 is the device address 0x01.

(3) Example of modifying equipment address:

The format of communication protocol for writing data is shown in the table below:

Address Code	Function Code	Data Address	New Address	CRC L	CRC H
0x01	0x06	0x00,0x0F	0x__		

Explain:

1. The range of address code is 0x01 ~ 0xFE, and the default value is 0x01;
2. This machine only supports writing the sensor address value. When writing, the high-order address is in the front and the low-order address is in the back;
3. When the device address is not known, the address code is written to FF

Example of writing sensor address:

Change 01 address to 09 address:

Send: 01 06 00 0f 00 09 79 CF

Return: 01 06 01 09 20 4F

5.3 Upper computer reads equipment data and software configuration

(1) Connect the device to the computer

The device is connected to the computer serial port through "RS485 to USB" or "RS485 to 232" devices.

(2) Check whether the device is connected

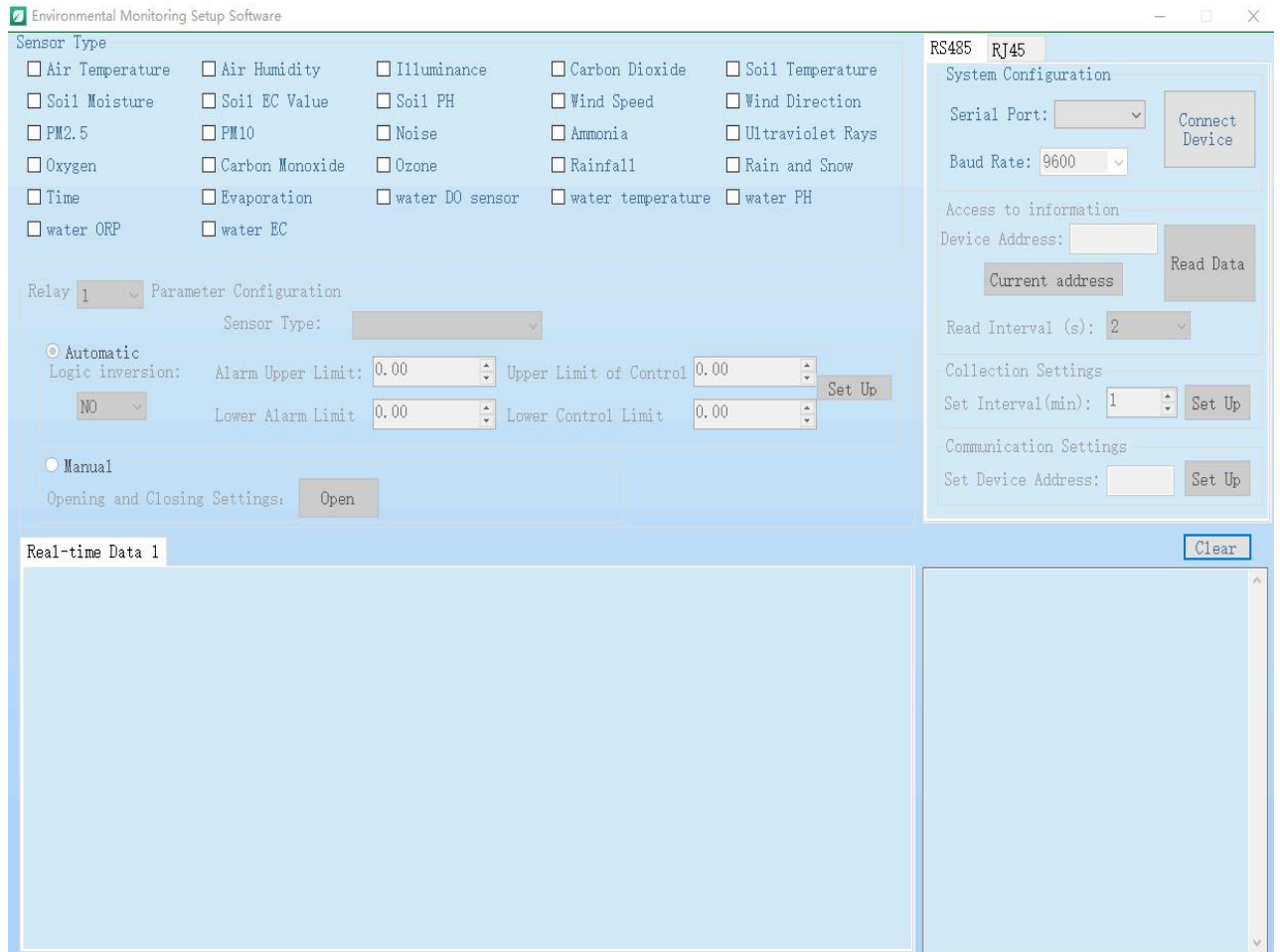
1) Open the computer device manager, check whether a new device is added under the port (COM and LPT), and remember the port number of this device (the following figure is only a schematic diagram, and the port numbers displayed on different computers are different)



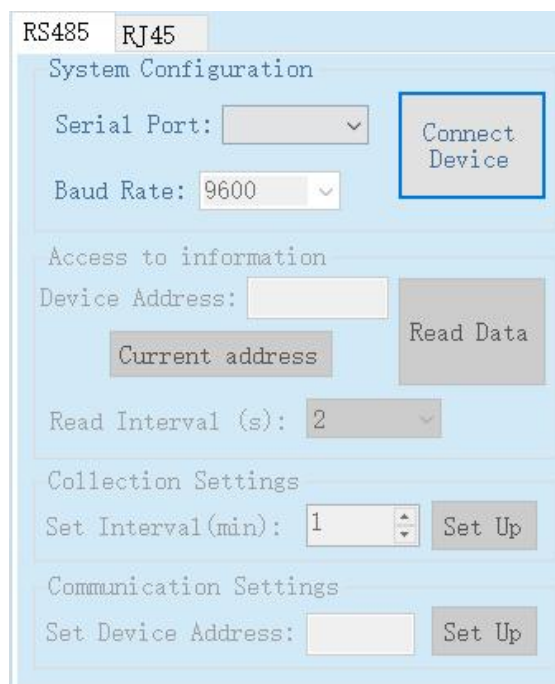
(3) (3) Read Data

1) Run "environmental monitoring setting software".

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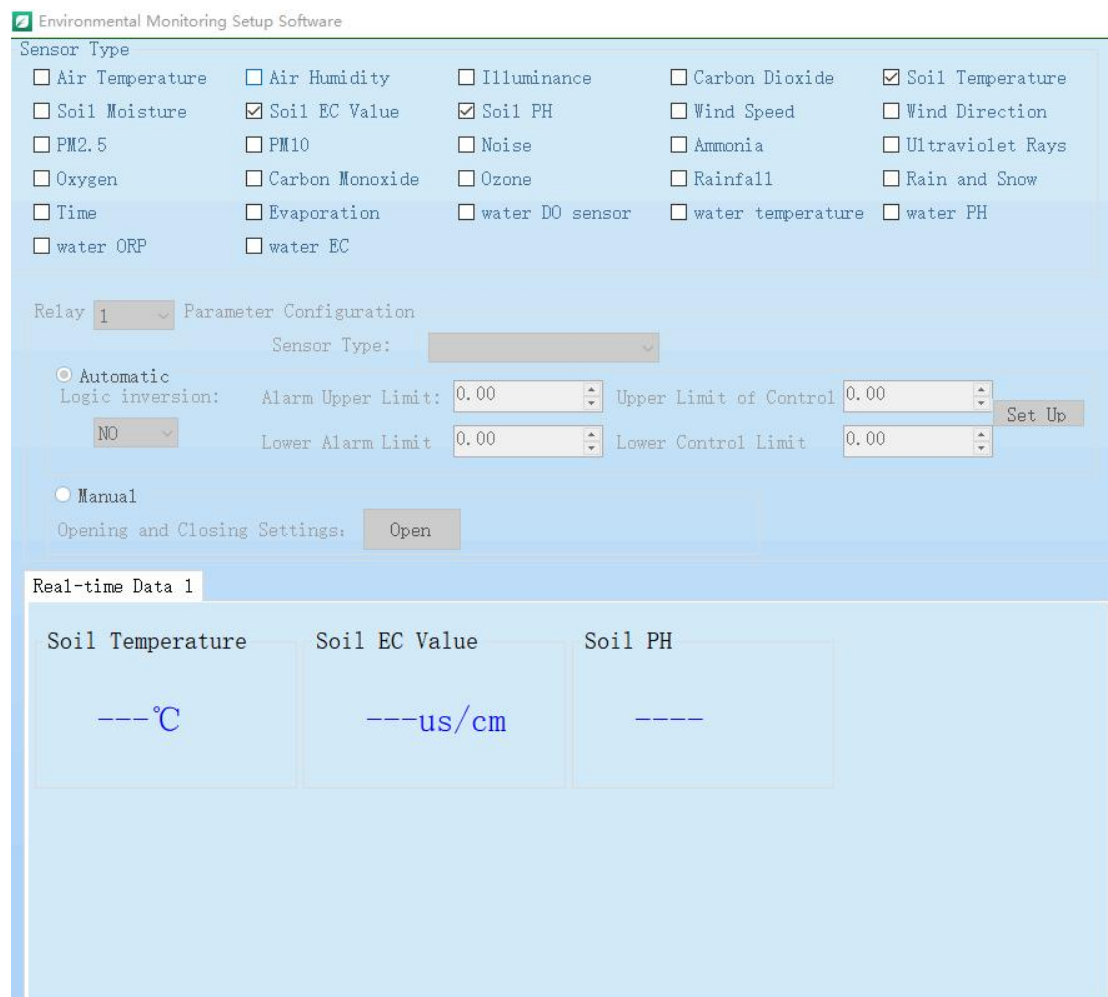
2) RS485:



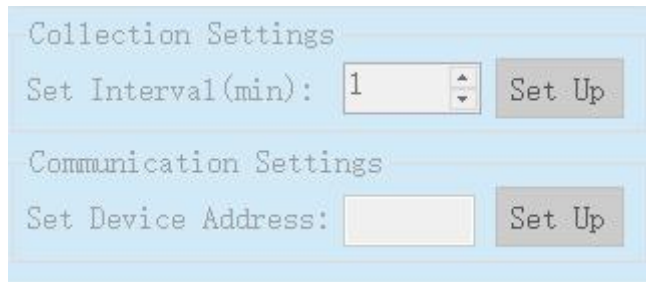
Select serial port number and baud rate (9600 by default, not selected), and click Connect device.



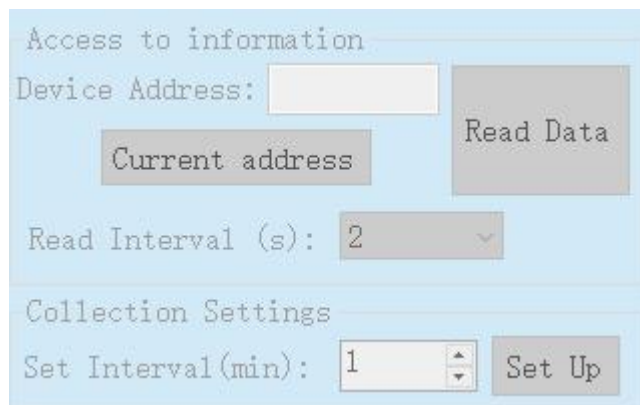
After the device is connected, the device address in [information acquisition] is loaded; In [sensor type selection], the function set in the current panel is checked by default; The checked function list is displayed in [real time data]. As shown in the figure:



Click the [device address] button to get the latest address of the current device. If it is empty, you can click the [Set up] Button



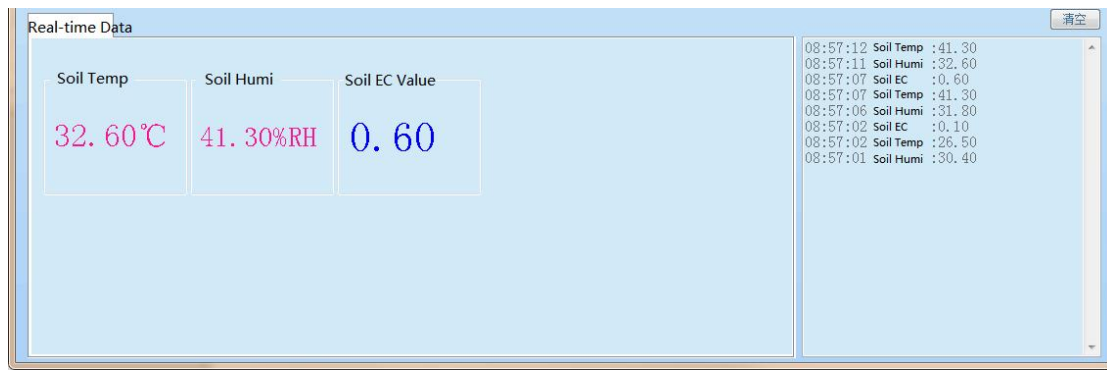
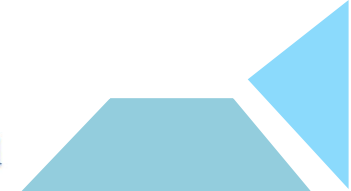
To modify the device address: select [communication settings], fill in the address to be modified in [set device address], and click [settings] to complete the modification



After the modification is completed, you will be prompted that the modification is successful。



(6) The upper computer views the device data: select [Acquisition Interval] and then click [Read Data]. The data is displayed as follows (cannot be exported):



Chapter VI Analog Signal

6.1 Analog 4-20mA

Range	Current Output Range
30dB	4mA
120dB	20mA

$$P \text{ (dB)} = 30\text{dB} + (I \text{ (Current)} - 4\text{mA}) * 5.625$$

6.2 0-5V Outout Signal

Range	Current Output Range
30dB	0V
120dB	5V

$$P \text{ (dB)} = 30\text{dB} + V_{\text{(voltage)}} * 18$$

6.3 0-10V Output Signal

Range	Current Output Range
30dB	0V
120dB	10V

$$P \text{ (dB)} = 30\text{dB} + V_{\text{(voltage)}} * 9$$

Chapter VII Fault analysis and quality assurance

7.1 Fault Analysis

NUM	Performance	Possible Faults	Solution
1	No communication signal	Cable fault	Check the power supply circuit with a multimeter
2	No Data	Interface connection failure	Interface connection failure
3	Wrong Data	Probe Wrong	Contact Us