

SUCH

Ceiling-Mounted Noise Sensor (RS-485) User Manual

SN-300XD2-ZS-N01

Ver 2.0

Chapter 1 Product Introduction

1.1 Product Overview

The ceiling-mounted noise sensor is a high-precision sound measuring instrument with a measurement range of 30dB~130dB, meeting daily measurement needs and widely used in various fields such as home, office, workshop, automotive measurement, and industrial measurement. The output signal type is RS485, with a maximum communication range of 2000 meters, using the standard ModBus protocol and supporting secondary development.

1.2 heatures

This product uses a high-sensitivity condenser microphone, ensuring stable signal and high accuracy. It features a wide measurement range, good linearity, ease of use, convenient installation, and long transmission distance. It employs a dedicated RS485 circuit for stable communication. It is powered by a wide voltage range of 7~30V, with a complete range of specifications and convenient installation.

1.3 Main Parameters

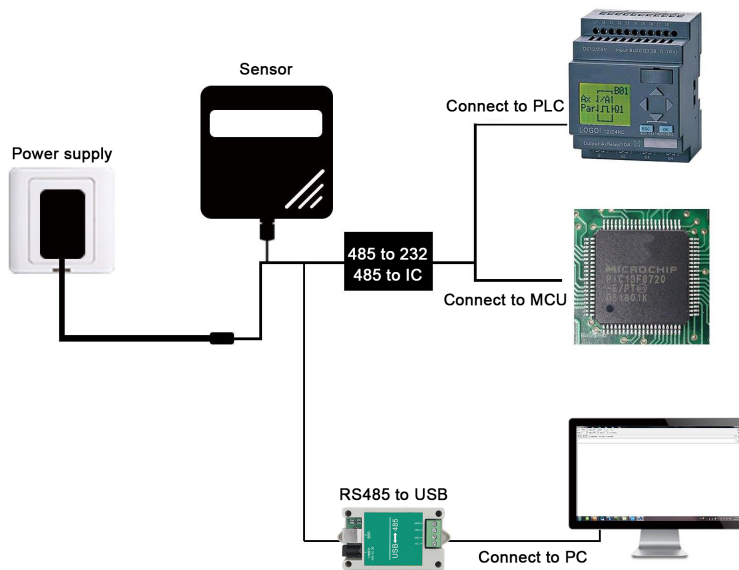
DC Power Supply (Default)	7~30V DC
Power	0.4W
Operating Environment	-20°C~+60°C, 0%RH~95%RH (Non-condensing)
Communication Interface	485 communication (Modbus) protocol Baud rate: 1200bit/s~115200bit/s Configurable data bit length: 8 bits Parity check: None Stop bit length: 1 bit Default Modbus communication address: 1 Supported function codes: 03
Parameter Settings	Configured via the 485 interface using the provided configuration software
Resolution	0.1dB
Measurement Range	30dB~130dB
Frequency Range	20Hz~12.5kHz
Response Time	≤3s
Stability	Less than 2% over the usage period
Noise Accuracy	±0.5dB (at reference pitch, 94dB@1kHz)

Device Dimensions:



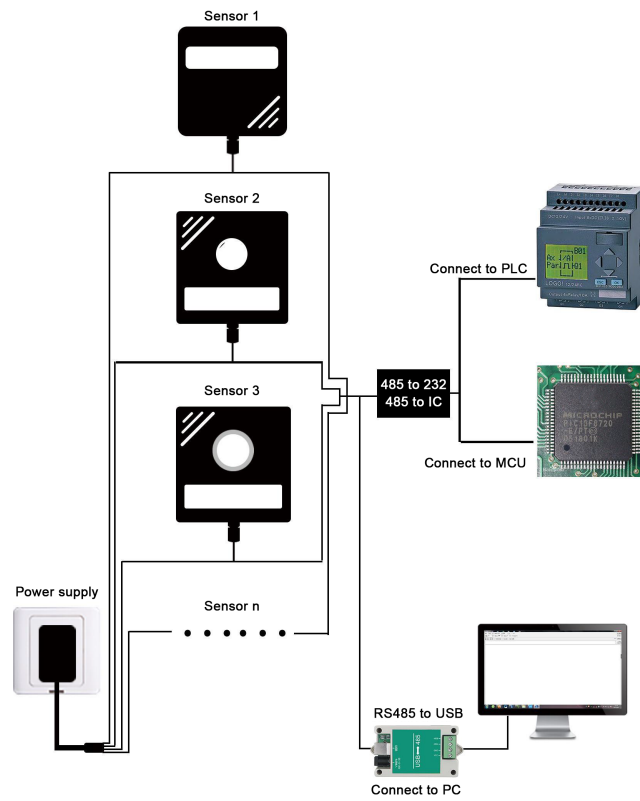
1.4 System Framework Diagram

Single connection



This product can also be used with multiple sensors combined on a single 485 bus. Theoretically, one bus can support 254 485 sensors. The other end can be connected to a PLC with a 485 interface, a microcontroller via a 485 interface chip, or a computer via a USB to 485 adapter. Use our company's sensor configuration tool for configuration and testing (only one device can be connected when using this configuration software).

Multiple connections



1.5 Product Selection

SN-			Code name
	300XD2-		New ceiling-mounted housing
		ZS-	Noise sensor
		N01	485 interface output

1.6 Product Appearance



Chapter 2 Hardware Connection

2.1 Pre-Installation Inspection

Equipment List:

- Transmitter (1 unit)
- 2 self-tapping screws and 2 expansion plugs
- Certificate of Conformity
- USB to 485 (optional)

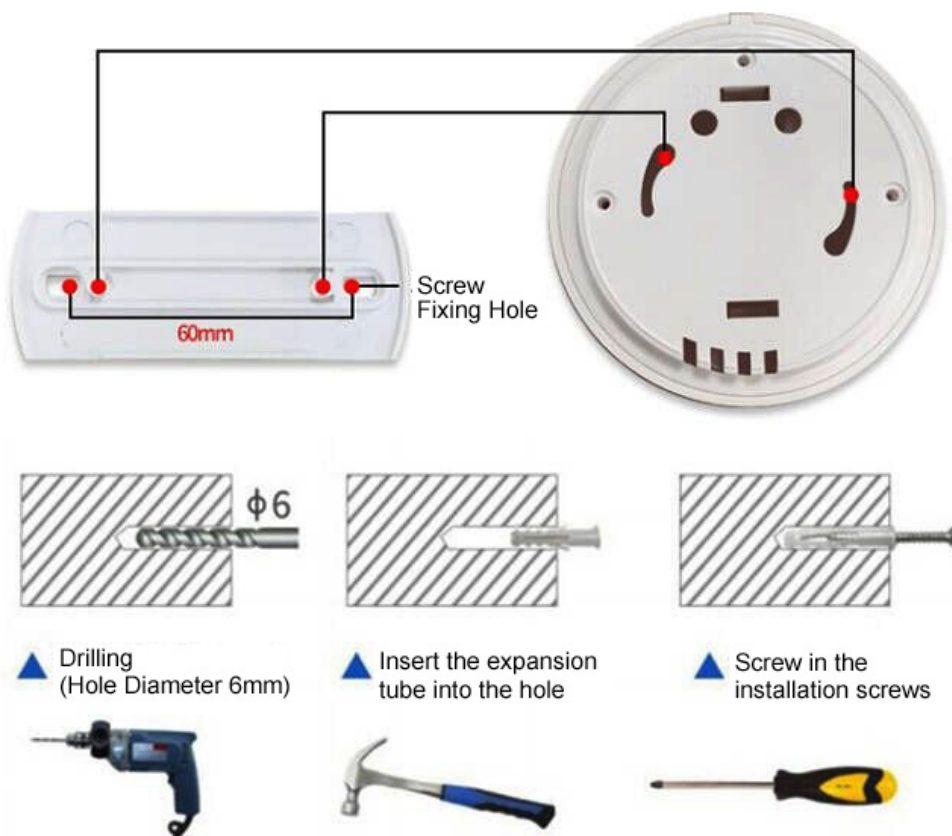
2.2 Interface Description

Wide voltage power input 7~30V is acceptable. When wiring the 485 signal cable, ensure that wires A and B are not reversed, and that addresses between multiple devices on the bus do not conflict.

2.2.1 Sensor Wiring

	Wire Color	Description
Power Supply	Brown	Positive Power (10~30V DC)
	Black	Negative Power
Communication	Yellow	485-A
	Blue	485-B

2.3 Installation Method



Chapter 3 Communication Protocol

3.1 Basic Communication Parameters

Encoding	8-bit binary
Data Bits	8 bits
Parity Bit	None
Stop Bit	1 bit
Error Check	CRC (CRC (Cyclic Redundancy Code))
Baud Rate	1200bit/s~115200bit/s adjustable, factory default is 4800bit/s

3.2 Data Frame Format Definition

The ModBus-RTU communication protocol is adopted, with the following format:

Initial Structure \geq 4 bytes (Time)

Address Code = 1 byte

Function Code = 1 byte

Data Area = N bytes

Error Check = 16-bit CRC code

End Structure \geq 4 bytes (Time)

Address Code: The transmitter's address, unique in the communication network (factory default 0x01).

Function Code: Indicates the function of the command sent by the host. This transmitter only uses function code 0x03 (reading register data).

Data Area: The data area contains the actual communication data. Note that the high byte of the 16-bit data is first!

CRC Code: A two-byte checksum.

Host Query Frame Structure:

Address Code	Function Code	Registry Start Address	Registry Length	Checksum Low Byte	Checksum High Byte
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave Response Frame Structure:

Address Code	Function Code	Number of Valid Bytes	Data Block 1	Data Block 2	Data Block N	Checksum
1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes

3.3 Register Address

Register Address	PLC or Configuration Address	Content	Supported Function Codes
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0000 H	40001	Instantaneous noise value uploaded is 10 times the actual value	0x03/0x04
0040H	40041	Noise upper limit: 10 times the actual value	0x03/0x04/ 0x06/0x10
0041H	40042	Noise lower limit: 10 times the actual value	0x03/0x04/ 0x06/0x10
0042H	40043	Delay time (seconds)	0x03/0x04/ 0x06/0x10
0043H	40044	Upper and lower limit hysteresis	0x03/0x04/ 0x06/0x10
0100H	40257	Relay control: 0: Open, 1: Closed	0x03/0x04/ 0x06/0x10
07D0H	42001	Device address (configurable from 1 to 254, factory default 1)	0x03/0x04/ 0x06/0x10
07D1H	42002	Baud rate 0 represents 2400 1 represents 4800 2 represents 9600 3 represents 19200 4 represents 38400 5 represents 57600 6 represents 115200 7 represents 1200	0x03/0x04/ 0x06/0x10

3.4 Examples and Explanations of Communication Protocols

Example: Reading the noise value query frame for device address 0x01:

Address Code	Function Code	Start Address	Data length	Checksum Low Byte	Checksum High Byte
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Response Frame (e.g., current noise value is 71.3 dB)

Address Code	Function Code	Returned Valid Byte Count	Current Noise Value	Checksum Low Byte	Checksum High Byte

0x01	0x03	0x02	0x02 0xC9	0x79	0x72
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Noise Calculation:

Current Noise: 02C9H (hexadecimal) = 713 => Noise = 71.3dB

Chapter 4 Common Problems and Solutions

Device cannot connect to PLC or computer

Possible reasons:

- 1) The computer has multiple COM ports, and the incorrect port is selected.
- 2) Incorrect device address, or devices with duplicate addresses (factory default is all 1).
- 3) Incorrect baud rate, parity method, data bits, or stop bits.
- 4) The host polling interval and response time are too short; both need to be set to at least 200ms.
- 5) The 485 bus is disconnected, or the A and B lines are reversed.
- 6) Too many devices or too long wiring; power should be supplied nearby, a 485 amplifier should be added, and a 120Ω terminating resistor should be added.
- 7) The USB to 485 driver is not installed or is damaged.
- 8) The device is damaged.

Chapter 5 Precautions

1) Warning: Risk of Personal Injury

This device is strictly prohibited from being used as a safety device, emergency stop device, or in any situation where personal injury may result from equipment malfunction.

2) Usage Restrictions

This device is for use only as designed and within its authorized scope.

Before installation, operation, or maintenance, the relevant instructions in the technical manual must be carefully read and understood. Failure to comply with the above warnings and guidelines may result in death or serious personal injury.

3) Users must not disassemble the device themselves, and must not touch the sensor core to avoid damage to the product.

4) Keep away from high-power interference equipment, such as frequency converters and motors, to avoid inaccurate measurements. Power must be disconnected before installing or removing the transmitter. Water must not enter the transmitter, as this can cause irreversible changes.

5) Prevent direct damage to the sensor from chemical reagents, oil, dust, etc. Do not use it for extended periods in condensation or extreme temperature environments. Protect against thermal shock.