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# **INSTRUCTION MANUAL**

**COMBUSTIBLE METHANE**

**TYPE RS485**

**JXBS-3001-CH<sub>4</sub>**

**VER1.1**

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# I BRIEF INTRODUCTION

## 1.1 Product Overview

THE COMBUSTIBLE METHANE SENSOR uses the specialized Combustible methane concentration sensor probe as core detecting device, which has the characteristics of wide measurement range, high precision, good linearity, good versatility, convenient using, easy installation, long transmission distance and moderate price.

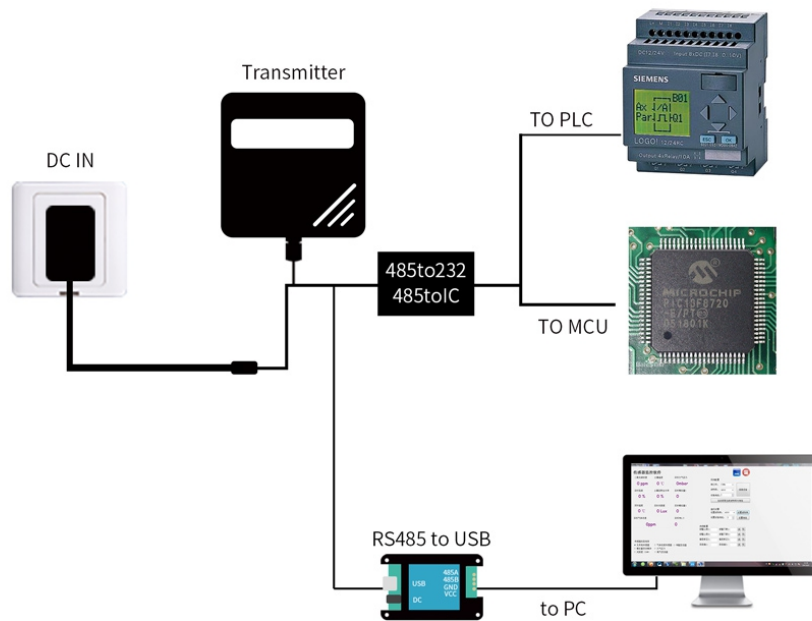
## 1.2 Primary Parameters

**TABLE 1 Primary Parameters**

| <b>PARAMETERS</b>            | <b>TECHNICAL SPECIFICATIONS</b>      |
|------------------------------|--------------------------------------|
| <b>MEASURING RANGE</b>       | 0-100%LEL                            |
| <b>MEASURING MODE</b>        | Catalytic combustion                 |
| <b>PRECISION</b>             | 3%F.s                                |
| <b>WARRANTY PERIOD</b>       | 2 years ( Host ) / 1 year ( Sensor ) |
| <b>RESPONSE TIME</b>         | less than 15 seconds                 |
| <b>BAUD RATE</b>             | 2400/4800/9600                       |
| <b>COMMUNICATION PORT</b>    | RS485                                |
| <b>POWER SUPPLY</b>          | Bus power, 12-24V DC                 |
| <b>POWER</b>                 | ≤1.5w                                |
| <b>OPERATING TEMPERATURE</b> | 0-50 °C                              |

|                                     |                              |
|-------------------------------------|------------------------------|
| <b>WORKING HUMIDITY ENVIRONMENT</b> | 15-90%RH                     |
| <b>CASE SIZE</b>                    | 110 x 85 x 44mm <sup>3</sup> |
| <b>PRESSURE RANGE</b>               | 0.9-1.1atm                   |

### 1.3 System Frame Diagram



**FIGURE 1 SINGLE-ENDED**

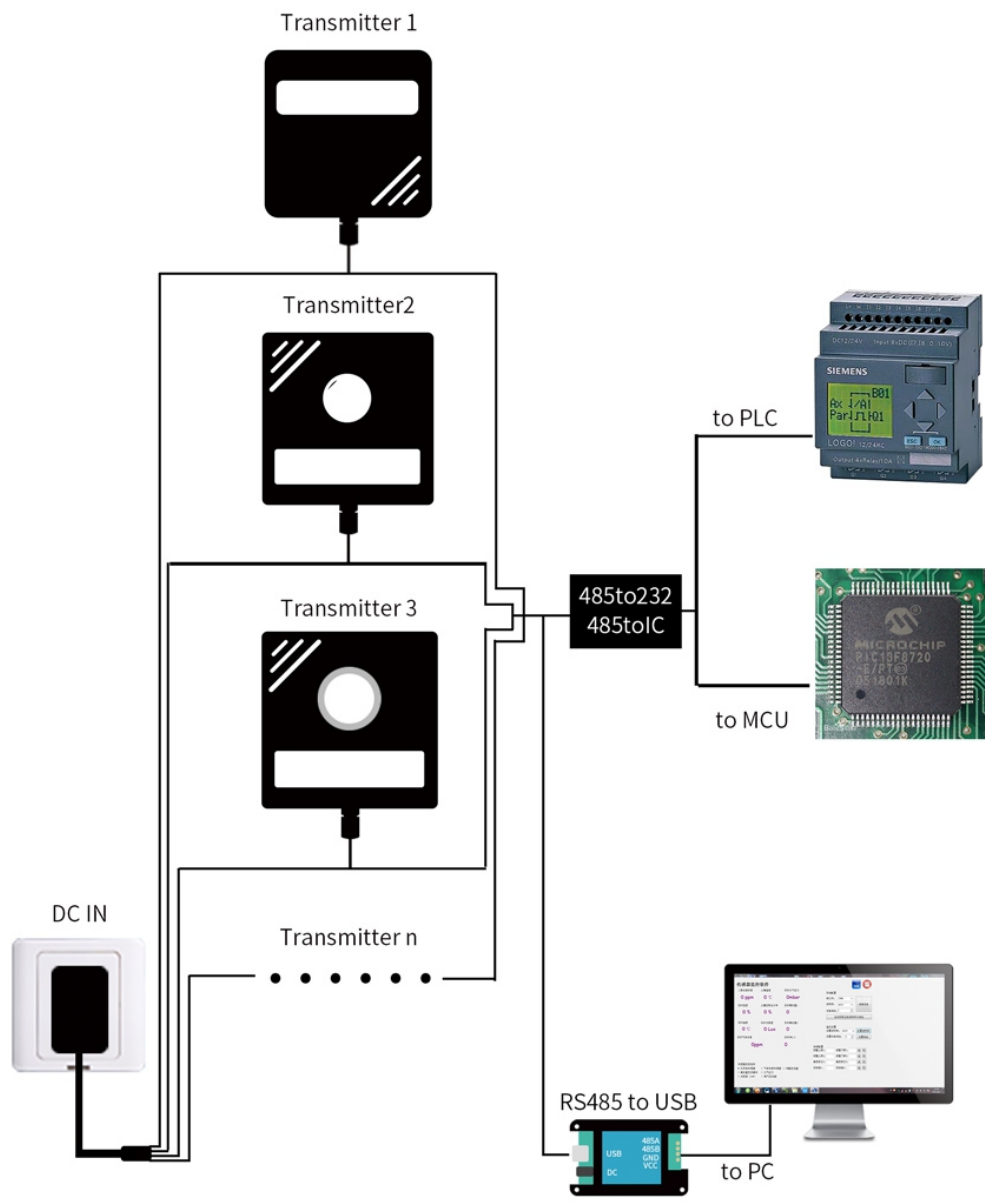


FIGURE 2 MUTIPLE-ENDED

## II HARDWARE CONNECTIONS

### 2.1 CHECKING BEFORE INSTALLATION

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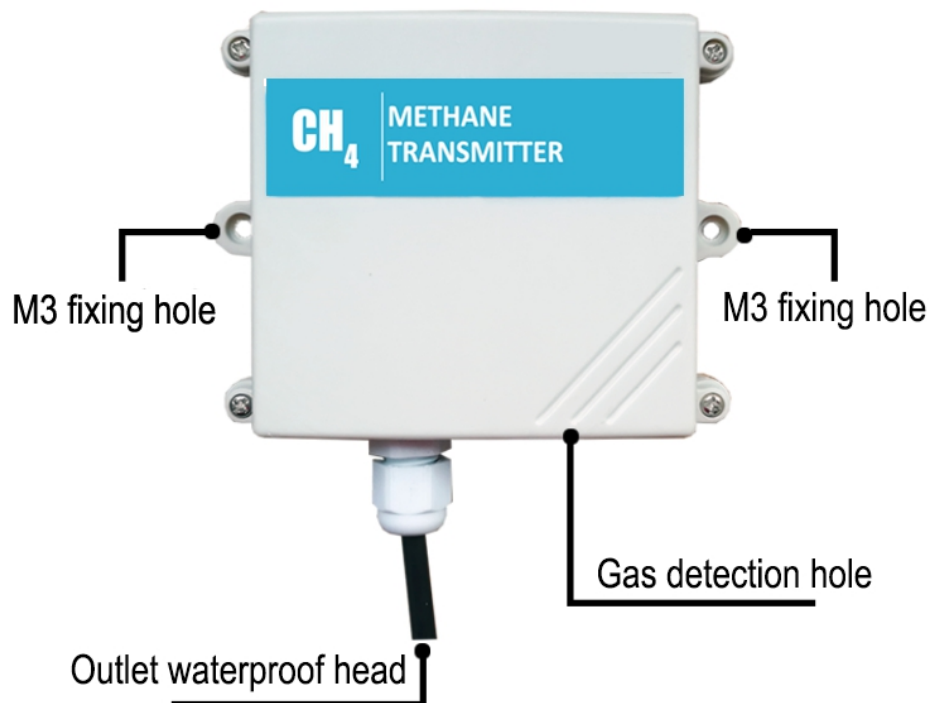
Check the list of devices before installation:

**TABLE 2 List of Devices**

| Name                             | Number |
|----------------------------------|--------|
| THE SENSOR DEVICE                | 1      |
| 12V POWER ADAPTER (Optional)     | 1      |
| THE USB TO 485 DEVICE (Optional) | 1      |
| WARRANTY CARD / CERTIFICATE      | 1      |

## 2.2 Interface Description

Before you wiring and use, please read this article in detail, Improper use may result in irreversible damage to the product.



**FIGURE 3 PHYSICAL PICTURE**

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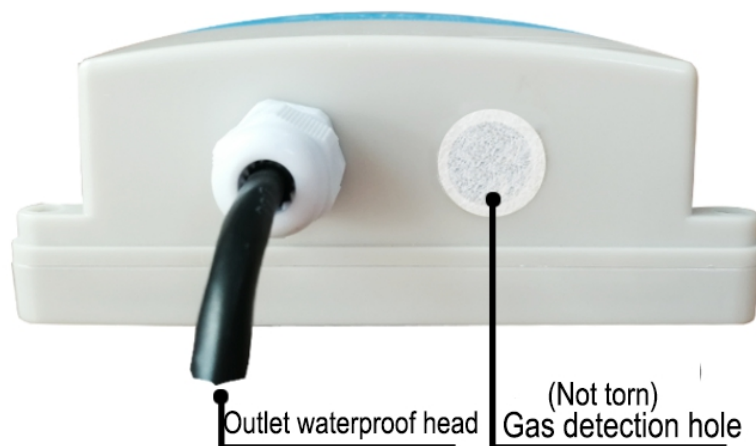
**TABLE 3 Wiring Sequence**

|                      | Line Color      | Description                         |
|----------------------|-----------------|-------------------------------------|
| <b>Power</b>         | Brown           | Power supply Positive ( 12-24V DC ) |
|                      | Black           | Power supply Negative               |
| <b>Communication</b> | Yellow ( Gray ) | 485-A                               |
|                      | Blue            | 485-B                               |

We provide default cable length of 0.6 meters, you can extend the cable yourself according to your needs.

## 2.3 Gas Detection Holes

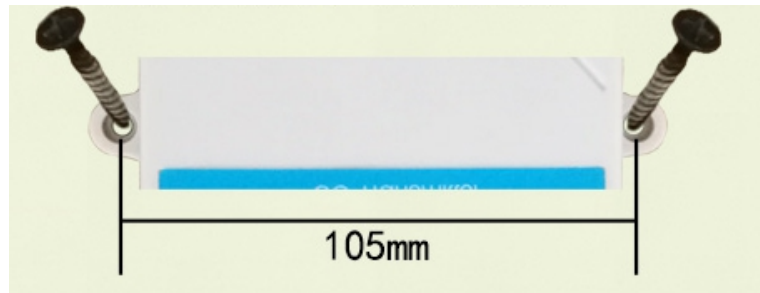
The gas detection hole uses a polymer gas membrane to isolate the membrane. This membrane is air- and water-tight and can permeate the gas but block the moisture. Do not destroy this membrane, otherwise it will affect the life of the product.



## 2.4 Installation Description

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The equipment needs to be placed in an environment where there is no wind and no rain. The equipment needs to be installed vertically. The device has two fixed holes with a spacing of 105mm. The size of each fixing hole is 3mm.



**FIGURE 4 HOW FIXTURES**

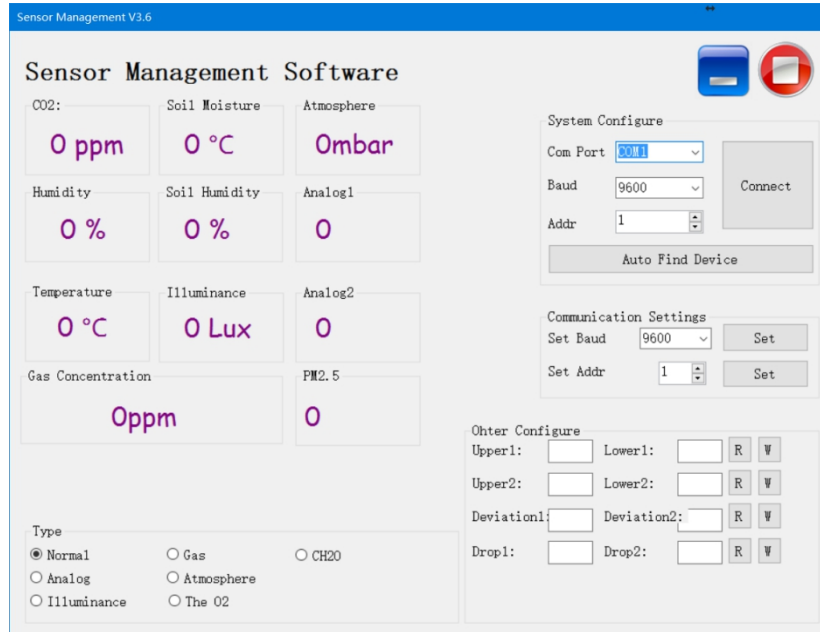
## **III CONFIGURATION TOOL INSTALLATION AND USE**

We provide **CONFIGURATION TOOL** , which can be easily used to test our sensor device.

### **3.1 Sensor Access Computer**

Transmitter can be connected to PC with the RS485 to USB adapter. You can check the COM port number through Device Manager (right click My Computer).

### **3.2 How To Use Configuration Tool**



Please note that this software can only test one device at the same time. After connecting the physical device, click the **CONNECT** button to read the information. In the UNCONNECT state, you can modify BAUD and ADDR in COMMUNICATION SETTINGS.

Under the software, different check boxes can be selected according to different situations. For example, you can choose the GAS option to test the RS485 OXYGEN SENSOR , you can choose the NORMAL option to test the RS485 TEMPERATURE AND HUMIDITY SENSOR .

## IV COMMUNICATION PROTOCOL

### 4.1 Communication Basic Parameters

TABLE 4 Communication Basic Parameters



| PARAMETERS     | CONTENT   |
|----------------|---|
| Protocol       | Modbus RTU  |
| Data bits      | 8 bit   |
| Parity bit     | No  |
| Stop bit       | 1 bit   |
| Error checking | CRC (redundant loop code)   |
| Baud rate      | 2400 bps/ 4800 bps/ 9600 bps can be set<br>factory defaults to 9600 bps |

For more information about **MODBUS RTU** please visit the website "[www.modbus.org](http://www.modbus.org)".

## 4.2 Register Address

**TABLE 5 Register Address**

| Register Address | Plc Configuration Address | Content                    | Operation |
|------------------|---------------------------|----------------------------|-----------|
| 0006H            | 40007                     | Explosion ( unit 0.1%LEL)  | Read-Only |
| 0100H            | 40101                     | Device Address (0-252)     | R/W       |
| 0101H            | 40102                     | Baud Rate (2400/4800/9600) | R/W       |

## 4.3 Communication example

### 4.3.1 Read Device Address 0x01's Flammable gas Concentration

**TABLE 6 Inquiry Frame**

| Address Code | Function Code | Start Address | Data Length | CRC_L | CRC_H |
|--------------|---------------|---------------|-------------|-------|-------|
| 0x01         | 0x03          | 0x00          | 0x00        | 0x64  | 0x0B  |
|              |               | 0x06          | 0x01        |       |       |

**TABLE 7 Answer Frames**

( For example, the reading is 0.2% )

| Address Code | Function Code | Returns to The Number Of Valid Bytes | Flammable gas Value | Check Digit Low | Check Digit High |
|--------------|---------------|--------------------------------------|---------------------|-----------------|------------------|
| 0x01         | 0x03          | 0x02                                 | 0x00                | 0x39            | 0x85             |
|              |               |                                      | 0x02                |                 |                  |

Flammable gas:

0x0002 ( hexadecimal ) =2=> Flammable gas =0.2%