

## User Guide

### Product Introduction

This sensor uses the MODBUS-RTU protocol, allowing the host computer to monitor data through RS485 communication. When paired with the UbiBot device, it enables remote measurement and online monitoring on a computer platform or mobile app. It features high accuracy, good linearity, wide compatibility, ease of installation, and long transmission distance.



### Use Case Scenarios

Widely used in factories, chemical industry, fertiliser, pharmaceuticals and other real-time monitoring of ammonia.

### Features

1. High performance imported bearings, low rotation resistance, accurate measurement.
2. Stronger stability and anti-interference ability.
3. Standard audio interface design, plug and play.
4. Wide voltage input, DC 10 ~ 30V.

### Product Specifications

| Specifications         |                                                                       |
|------------------------|-----------------------------------------------------------------------|
| Model                  | UB-NH3-I1                                                             |
| Power Supply           | DC 10 ~ 30V                                                           |
| Max Current            | 834mA (@12V)                                                          |
| Measuring Range        | 0 ~ 500ppm                                                            |
| Resolution             | 1ppm                                                                  |
| Accuracy               | ±5%FS (@100ppm, 25°C, 50%RH) Oxygen content: ≥ 18%VOL                 |
| Working Environment    | -20 ~ 50°C                                                            |
| Connector              | Audio                                                                 |
| Dimensions             | 110 * 85 * 44mm                                                       |
| Cable Length           | 3m                                                                    |
| Communication Protocol | RS485 Modbus RTU Protocol                                             |
| RS485 Address          | 0xC8                                                                  |
| Baud Rate              | 1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s (default), 19200 bit/s |

### Wiring Instruction



### Communication Protocols

#### 1. Communication Basic Parameters

| Communication Basic Parameter |                                                                       |
|-------------------------------|-----------------------------------------------------------------------|
| Coding System                 | 8-bit binary                                                          |
| Data Bit                      | 8 bits                                                                |
| Parity Checking Bit           | none                                                                  |
| Stop Bit                      | 1 bit                                                                 |
| Error Checking                | CRC Check                                                             |
| Baud Rate                     | 1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s (default), 19200 bit/s |

## 2. Data Frame Format

The Modbus-RTU communication protocol is used in the following format:

- Initial structure  $\geq 4$  bytes in time.
- Address code: 1 byte, default 0xC8.
- Function code: 1 byte, support function code 0x03 (read only) and 0x06 (read / write).
- Data area: N bytes, 16-bit data, high byte comes first.
- Error check: 16-bit CRC code.
- End structure  $\geq 4$  bytes of time.

| Request       |               |                  |                  |           |         |           |         |
|---------------|---------------|------------------|------------------|-----------|---------|-----------|---------|
| Slave Address | Function Code | Register Address | No. of Registers | CRC LSB   | CRC MSB |           |         |
| 1 byte        | 1 byte        | 2 bytes          | 2 bytes          | 1 byte    | 1 byte  |           |         |
| Response      |               |                  |                  |           |         |           |         |
| Slave Address | Function Code | No. of Bytes     | Content 1        | Content 1 | ...     | Content n | CRC     |
| 1 byte        | 1 byte        | 1 byte           | 2 bytes          | 2 bytes   | ...     | 2 bytes   | 2 bytes |

## 3. Register Address

| Register Address |               |                 |               |                                                                     |
|------------------|---------------|-----------------|---------------|---------------------------------------------------------------------|
| Address          | Content       | Register Length | Function Code | Description of Definitions                                          |
| 0x0000 / 0002    | Ammonia Value | 1               | 03            | Integer data                                                        |
| 0x07D0           | Address       | 1               | 03/06         | 1 ~ 255                                                             |
| 0x07D1           | Baud Rate     | 1               | 03/06         | 0:2400, 1:4800, 2:9600, 3:19200, 4:38400, 5:57600, 6:115200, 7:1200 |

### NOTE

1. Do not install the equipment for use in a strong convection air environment.
2. The equipment should avoid contact with organic solvents (including silicone and other adhesives), paints, chemicals, oils and highly concentrated gases.
3. The device should not be used for a long time in an environment containing corrosive gases, which can damage the sensor.
4. Do not place the device for a long time in a high concentration of organic gases, long-term placement will lead to sensor zero point drift, slow recovery.
5. Prohibit long time storage and use in high concentration of alkaline gas, avoid strong sunlight direct exposure to the sensor and lead to high temperature.