

# CO2 Probe User Guide

## Product Introduction

The carbon dioxide probe is an industrial-grade probe with high integration. The data is sent from the internal chip of the probe to the computer through the modbus-RS485 interface, and multiple probes can be connected to the bus network to realize real-time monitoring of multiple field environments. It has super stability and anti-interference ability, strong product protection performance and first grade lightning protection, which can be used in agricultural industry and other occasions.



## Use Case Scenarios

It is widely used in agricultural greenhouses, intelligent buildings, workshops, warehouses, pharmacies, libraries, museums, laboratories, offices, ventilation ducts and other places where carbon dioxide concentration needs to be monitored.

## Features

1. RS485 interface, communication distance up to 1200 meters.
2. High precision, wide range, good consistency.
3. Standard audio interface design, easy to plug.
4. Super stability and anti-interference.
5. Standard MODBUS RTU protocol.
6. Able to accurately measure CO2 concentration.
7. The product has strong protective performance and first grade lightning protection.

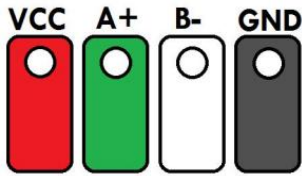
## Product Specifications

Specifications		
Model	UB-CO2-P1	UB-CO2-P2
Measuring Range	CO2: 0~40000ppm Temperature: -40°C ~70°C Humidity: 0 ~ 100%RH	CO2: 0~40000ppm Temperature: -10°C ~60°C Humidity: 0 ~ 100%RH
Measuring Accuracy	CO2: ±(30ppm+3%) (@400-10000ppm) Temperature: ± (0.4°C +1%) (@0~50°C) Humidity: ± 3%RH(@25°C, 0~100%RH)	CO2: ±(50ppm+5%) (@400-2000ppm) Temperature: ±0.8°C(@15~35°C); ±1.5°C(@-10~60°C) Humidity: ± 6%RH(@15~35°C, 20~65%RH), ± 9%RH(@-10~60°C, 0~100%RH)
Working Voltage	DC5V	DC5/12V
Output Interface	RS485	
Communication Protocol	MODBUS RTU	
Address	0x61	
Baud Rate	1200 bit/s,2400 bit/s, 4800 bit/s, 9600 bit/s (default), 19200 bit/s	
Standby Current	20mA	

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Interface Type	Audio Interface
Dimensions	65*46*29mm
Cable Length	3m

### Wiring Instruction:



### Communication Protocol

1. The information transmission mode is asynchronous, byte format is 1 start bit, 8 data bits, and 1 stop bit, no check.

2. Compliance with MODUBS RTU protocol standards.

\* This protocol is a master slave protocol. There is one master station and several slave stations on a bus. The communication parameters between each station must be consistent, including baud rate, data bits, check bit check method and stop bits. The address of each slave station must be different, otherwise the slave station response may conflict.

Query Message from Master (Read)							
Address	Function Code (Read)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB
0x61	0x03	RegAddr_H	RegAddr_L	Data_H	Data_L	CRC16_L	CRC16_H

Response Message from Slave									
Address	Function Code (Read)	Byte Count	Data1 MSB	Data1 LSB	Data2 MSB	Data2 LSB	...	CRC16 LSB	CRC16 MSB
0x61	0x03	BytesLenth	Data1_H	Data1_L	Data2_H	Data2_L	...	CRC16_L	CRC16_H

Query Message from Master (Write)							
Address	Function Code (Write)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB
0x61	0x06	RegAddr_H	RegAddr_L	Data_H	Data_L	CRC16_L	CRC16_H

Response Message from Slave							
Address	Function Code (Write)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB
0x61	0x06	RegAddr_H	RegAddr_L	Data_H	Data_L	CRC16_L	CRC16_H

Example:

1. Modify baud rate

Query Message from Master (Write)							
Address	Function Code (Write)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB

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0x61	0x06	0x00	0x65	0x00	0x03	0xD0	0x74
Response Message from Slave							
Address	Function Code (Write)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB
0x61	0x06	0x00	0x65	0x00	0x03	0xD0	0x74

0x0000 : 1200bps, 0x0001 : 2400bps, 0x0002: 4800bps, 0x0003: 9600bps, 0x0004: 19200bps,

### 2. Read status register

Query Message from Master (Read)							
Address	Function Code (Read)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB
0x61	0x03	0x00	0x27	0x00	0x01	0x3D	0xA1
Response Message from Slave							
Address	Function Code (Read)	Byte Count	Data1 MSB	Data1 LSB	CRC16 LSB	CRC16 MSB	
0x61	0x03	0x02	0x00	0x01	0x8C	0xDD	

00 : Status register not ready; 01: Status register ready.

### 3. Read version number

Query Message from Master (Read)							
Address	Function Code (Read)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB
0x61	0x03	0x00	0x88	0x00	0x01	0x0D	0x80
Response Message from Slave							
Address	Function Code (Read)	Byte Count	Data1 MSB	Data1 LSB	CRC16 LSB	CRC16 MSB	
0x61	0x03	0x02	0x01	0x02	0xB8	0x1D	

### 4. Read data

Query Message from Master (Read)									
Address	Function Code (Read)	Starting Address Hi	Starting Address Lo	No.of Registers Hi	No.of Registers Lo	CRC16 LSB	CRC16 MSB		
0x61	0x03	0x00	0x28	0x00	0x06	0x4C	0x60		
Response Message from Slave (CO2: 439ppm, Temperature: 27.2°C, Humidity: 48.8%)									
Address	Function Code (Read)	Byte Count	CO2_Hi MSB	CO2_Hi LSB	CO2_Lo MSB	CO2_Lo LSB	Temp_Hi MSB	Temp_Hi LSB	Temp_Lo MSB
0x61	0x03	0x0C	0x43	0xDB	0x8C	0x2E	0x41	0xD9	0xE7
Temp_Lo LSB	Hum_Hi MSB	Hum_Hi LSB	Hum_Lo MSB	Hum_Lo LSB	CRC16 LSB	CRC16 MSB			
0x2E	0x42	0x43	0x3A	0x1B	0x50	0x07			