GZ04-CO2 temperature and humidity integrated Transmitter instruction manual(Type 485)

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1. product description

1.1 product description

The transmitter adopts a new infrared verification technology to measure CO2 concentration. The response is quick and sensitive, avoiding the life and long-term drift of traditional electrochemical sensors. It is widely used in agricultural greenhouses, flower cultivation, edible fungus cultivation, etc. that require CO2 and temperature and humidity Monitoring occasions. 485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, the farthest communication distance is 2000 meters. The equipment has 10-30V wide-voltage power supply, and the enclosure has a high degree of protection, which can adapt to various harsh conditions on site.

1.2 Features

1. New infrared calibration technology for CO2 concentration measurement, with high accuracy, low drift and long life

2. Wide measuring range, default 0-5000ppm (default), with temperature compensation, little influence by temperature.

3.485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, the farthest communication distance is 2000 meters

4. The product adopts wall-mounted waterproof shell, which is easy to install and has a high degree of protection.

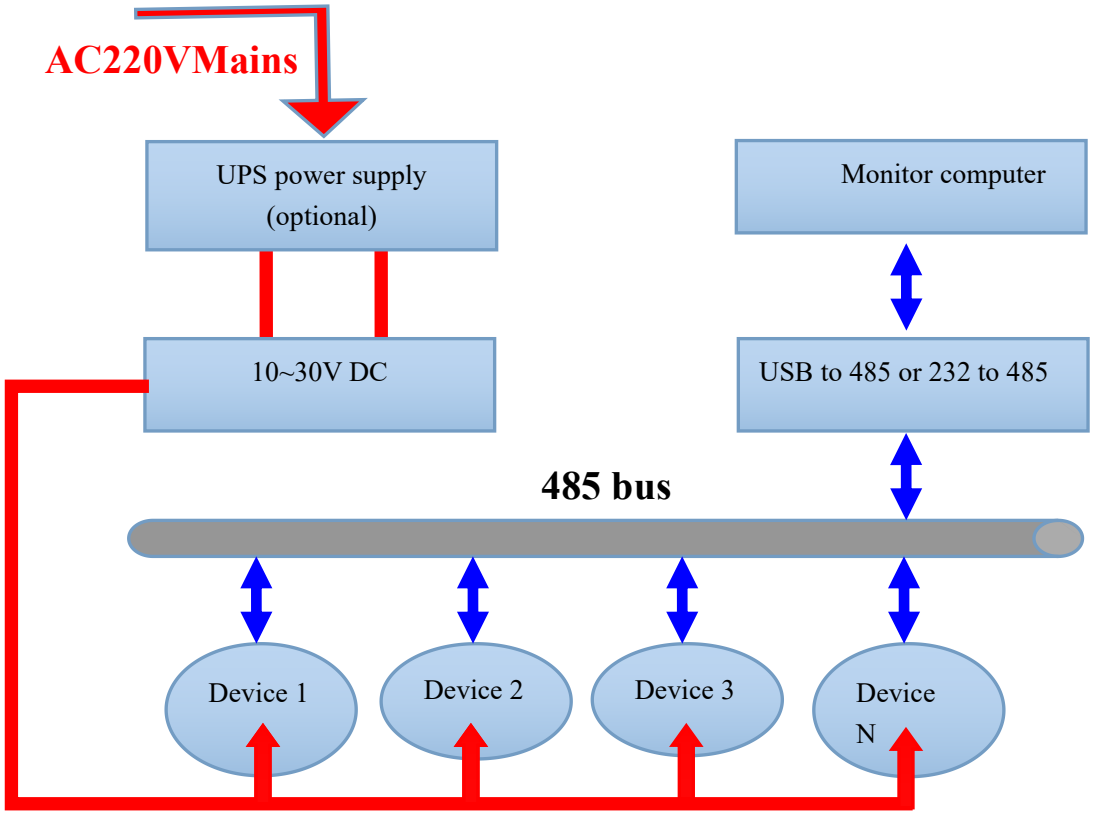
1.3 Main Specifications

Power consumption: 0.3W (24VDC)
Power supply: 10~30VDC
CO2 measurement range: 0~5000ppmCO2
Humidity:±2%RH(5%RH~95%RH,25℃)
Temperature:±0.4℃（25℃）
Accuracy: ±(50ppm+3%F·S)(25℃)
Transmitter circuit operating temperature humidity:-40℃~+120℃ default：-40℃~+80℃
Transmitter circuit operating humidity:0%RH-100%RH
CO2 measurement range: 0~10000ppm (optional)
CO2 accuracy: ±(50ppm+5%F·S)(25℃)
Stability: <2%F·S
Non-linearity: <1%F·S
Data update time: 2s
Response time: generally less than 90S at 90% step change
Working environment: -10~+50℃, 0-80%RH (non-condensing)
Average current: <85mA
System warm-up time: 2min (available), 10min (maximum accuracy)
Temperature influence: built-in temperature compensation

1.4product model

GZ04-				Product code
	CO2-			CO2 concentration transmitter, sensor
	CO2WS-			CO2 concentration temperature and humidity three-in-one transmission, sensor
		N01-		RS485 (M0dbus protocol)
			2	Wall-mounted king-shaped shell built-in probe
			2lw	King shell external probe

1.5System frame diagram



System scheme block diagram

2. Equipment installation instructions

2.1 Inspection before equipment installation

Equipment List:

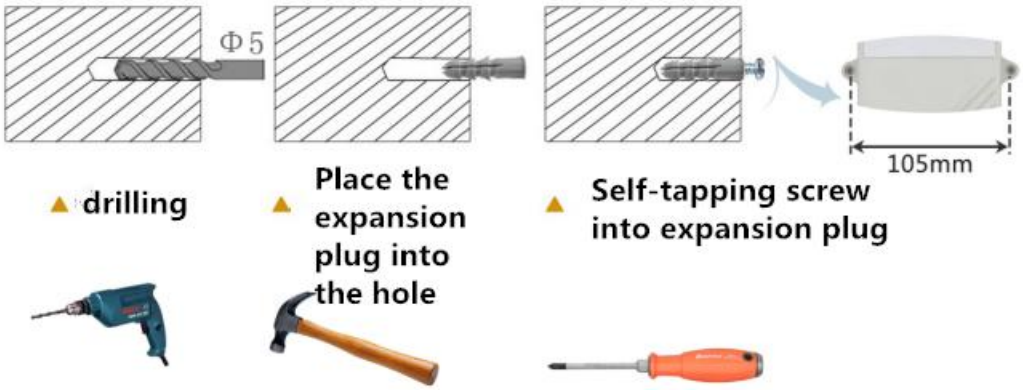
1. 1 CO2 transmitter equipment

2. Self-tapping screws (2 pcs), expansion plugs (2 pcs)

3. Product certificate, warranty card, wiring instructions, etc.

4. USB to 485 (optional)

2.2 Installation step instructions



2.3 Interface Description

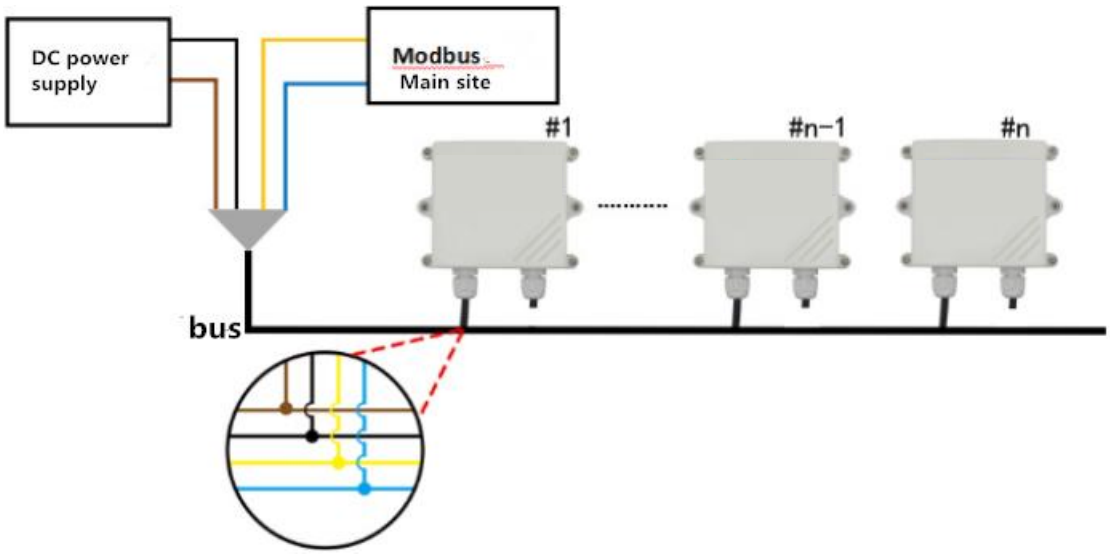
Wide-voltage power input can be 10~30V. When wiring the 485 signal line, pay attention to the two wires A\B not to be reversed, and the addresses of multiple devices on the bus cannot conflict.

	Thread color	Description
power supply	brown	Positive power supply (10~30V DC)
	black	Power negative
Communication	yellow	485-A
	blue	485-B

2.4 485 Field wiring instructions

When multiple 485 devices are connected to the same bus, there are certain requirements for

field wiring. For details, please refer to the "485 Device Field Wiring Manual" in the data package.

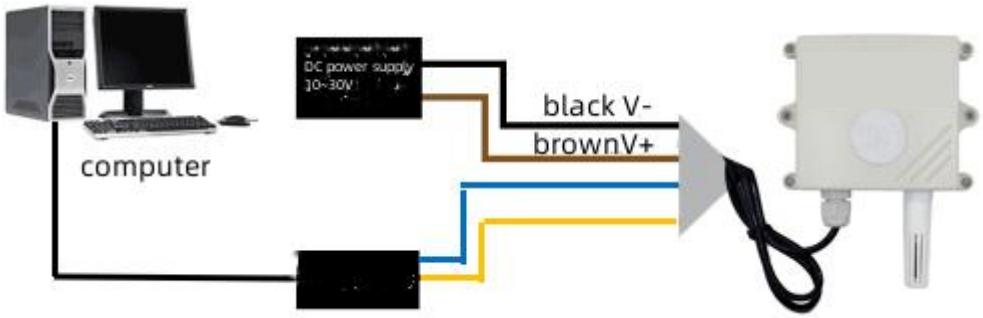


3. Configuration software installation and use

3.1 Software selection

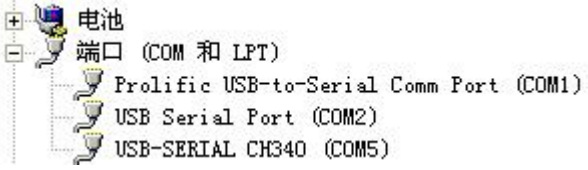
Open the data package, select "Debugging software" --- "485 parameter configuration software",turn up 

Just open it.



3.2 parameter settings

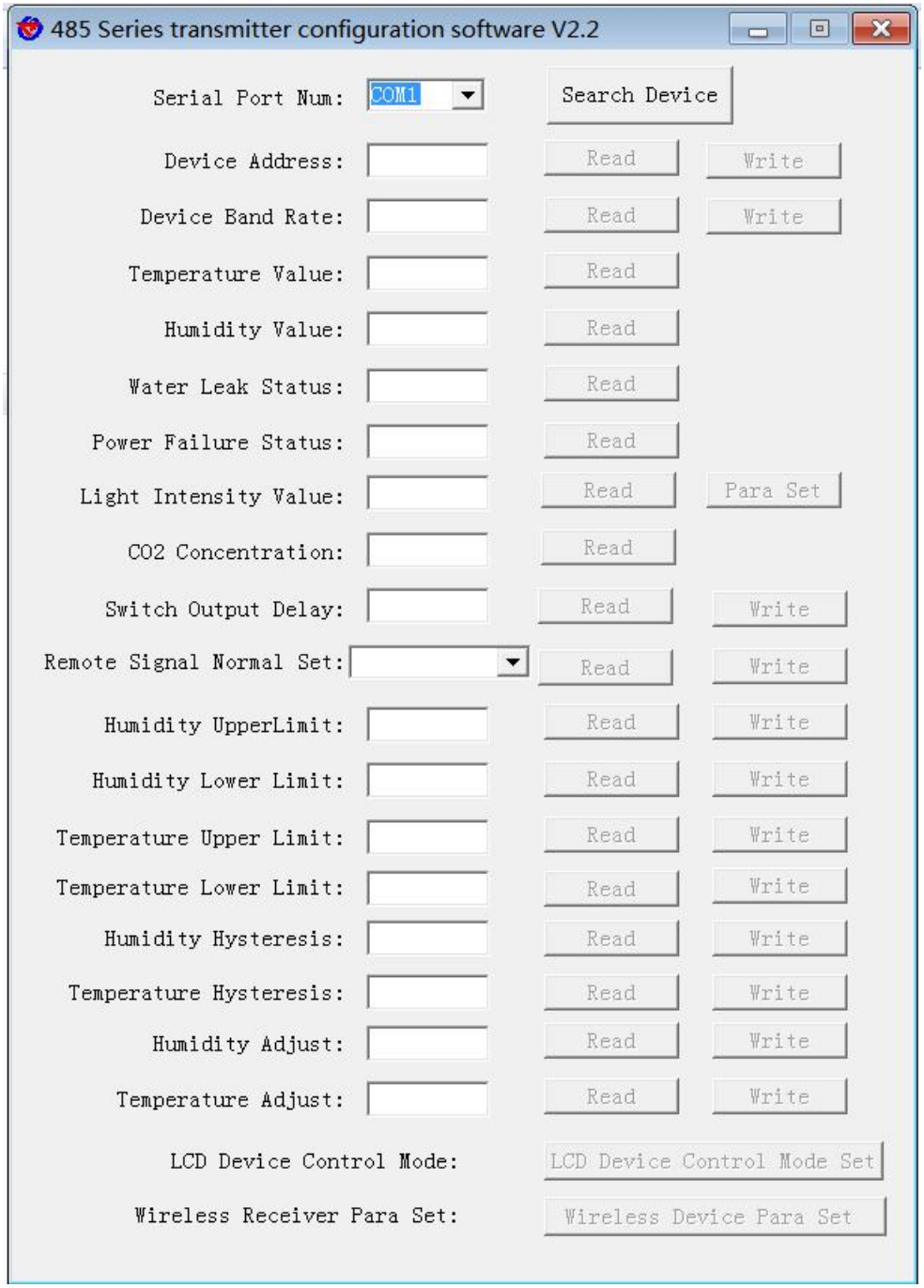
① Select the correct COM port (check the COM port in "My Computer—Properties—Device Manager—Port"). The following figure lists the driver names of several different 485 converters.



② Connect only one device alone and power it on, click the test baud rate of the software, the software will test the baud rate and address of the current device, the default baud rate is 4800bit/s, and the default address is 0x01.

③. Modify the address and baud rate according to the needs of use, and at the same time query the current function status of the device.

④. If the test is unsuccessful, please recheck the equipment wiring and 485 driver installation.



4. letter of agreement

4.1 Basic communication parameters

Code	8-bit binary
Data bit	8-bit
Parity bit	no
Stop bit	1 person
Error	CRC (Redundant Cyclic Code)

checking	
Baud rate	2400bit/s, 4800bit/s, 9600 bit/s can be set, the factory default is 4800bit/s

4.2 Data frame format definition

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

Initial structure ≥ 4 bytes time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

Time to end structure ≥ 4 bytes

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

Function code: the command function instruction issued by the host, the transmitter uses function code 0x03 (read register data) 06 (write register).

Data area: The data area is the specific communication data, pay attention to the high byte of 16bits data first!

CRC code: two-byte check code.

Host query frame structure:

address code	function code	Register start address	Register length	Check code low bit	Check code high
1byte	1byte	2byte	2byte	1byte	1byte

Slave machine response frame structure:

address code	function code	Effective bytes	Data area	Second data area	Nth data area	Check code
1byte	1byte	1byte	2byte	2byte	2byte	2byte

4.3 Register address

Register address	PLC or configuration address	content	operating	Scope and definition
0000 H	40001	Humidity value	Read only	0~1000
0001 H	40002	Temperature value	Read only	-400~1000

0002 H	40003	CO2 concentration value	Read only	0~5000
0030 H	40049	Temperature upper limit alarm value	Read and write	-400~1000
0031 H	40050	Temperature lower limit alarm value	Read and write	-400~1000
0032 H	40051	Temperature alarm return difference	Read and write	0~1000
0033 H	40052	Temperature calibration value	Read and write	-400~1000
0034 H	40053	Temperature relay enable	Read and write	1 is enable 0 is disabled
0035 H	40054	Humidity upper limit alarm value	Read and write	0~1000
0036 H	40055	Humidity lower limit alarm value	Read and write	0~1000
0037 H	40056	Humidity alarm return difference	Read and write	0~1000
0038 H	40057	Humidity calibration value	Read and write	-400~1000
0039 H	40058	Humidity relay enable	Read and write	1 is enable 0 is disabled
003a H	40059	CO2 upper limit alarm value	Read and write	0~5000
003b H	40060	CO2 lower limit alarm value	Read and write	0~5000
003c H	40061	CO2 alarm return difference	Read and write	0~5000
003d H	40062	CO2 calibration value	Read and write	-2000~2000

003e H	40063	CO2 relay enable	Read and write	1 is enable 0 is disabled
0040 H	40065	Relay status	Read and write	1 for pull-in 0 for disconnection

4.4 Communication protocol example and explanation

4.4.1 Read CO2 value of device address 0x01

Interrogation frame

address code	function code	starting address	Data length	Check code low bit	Check code high
0x01	0x03	0x00 0x02	0x00 0x01	0x25	0xCA

Response frame (for example, read CO2 is 3000ppm)

address code	function code	Returns the number of valid bytes	CO2 value	Check code low bit	Check code high
0x01	0x03	0x02	0x0B 0xB8	0xBF	0x06

CO2：

BB8 H(Hexadecimal) =3000 => CO2=3000 ppm

4.4.2Read the temperature, humidity and CO2 value of the device address 0x01

Interrogation frame

address code	function code	starting address	Data length	Check code low bit	Check code high
0x01	0x03	0x00 0x00	0x00 0x03	0x05	0xCB

Response frame (for example, temperature value -7.5℃, humidity value 35.9%, CO2 value 3000ppm)

address code	function code	Number of bytes	Humidity value	Temperature value	CO2	Check code low bit	Check code high
0x01	0x03	0x06	0x01 0x67	0xFF 0xB5	0x0B 0xB8	0x33	0xDC

Temperature: when the temperature is lower than 0℃, upload in the form of complement code.
FFB5 H (hexadecimal) = -75 => temperature = -7.5℃
humidity:
167 H (hexadecimal) = 359 => humidity = 35.9%RH
CO2:
BB8 H (hexadecimal) =3000 => CO2=3000 ppm

5. Common problems and solutions

The device cannot connect to the PLC or computer

possible reason:

1) The computer has multiple COM ports, and the selected port is incorrect.
2) The device address is wrong, or there are devices with duplicate addresses (the factory default is all 1).
3) The baud rate, check method, data bit, stop bit are wrong.
4) The host polling interval and waiting response time are too short, and both need to be set above 200ms.
5) The 485 bus is disconnected, or the A and B wires are connected reversely.
6) If the number of equipment is too large or the wiring is too long, power should be supplied nearby, and a 485 booster should be added and a 120Ω terminal resistance should be added at the same time.
7) The USB to 485 driver is not installed or damaged.
8) The equipment is damaged.

6. Appendix: Shell size