GZ01 CO_2 temperature and humidity Transmitter instruction manual (Type 485)



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1. product description

1.1 product description

In order to meet the needs of detecting CO_2 concentration, light intensity, temperature and humidity in agricultural greenhouses, flower cultivation and other occasions, our company independently developed this GZ01 CO_2 temperature and humidity transmitter. The transmitter adopts imported NDIR sensor for CO_2 concentration measurement, which is quick and sensitive, avoiding the life and long-term drift problems of traditional electrochemical sensors; adopts high-precision photosensitive transmitter to measure illuminance, and the output value measurement unit is Lux; adopts Switzerland The imported temperature and humidity measuring unit measures temperature and humidity, with high measurement accuracy and strong anti-interference ability.

The transmitter adopts 485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, and 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

■High-precision illuminance detection measuring range 0-65535 Lux, 0-200,000 Lux is optional.

■Imported NDIR sensor is used for CO_2 concentration measurement, with high accuracy, small drift and long life

■The temperature and humidity measurement unit imported from Switzerland is used to measure temperature and humidity, with high measurement accuracy and strong anti-interference ability.

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

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

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

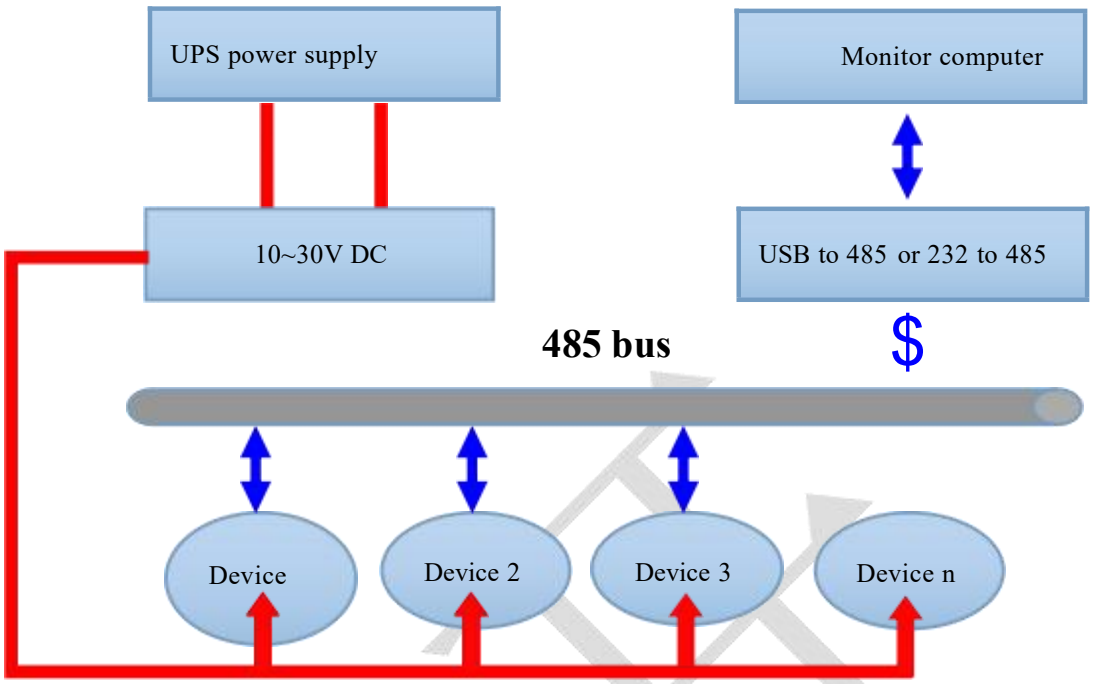
1.3 Main Specifications

DC power supply (default)	10-30VDC	
Maximum power consumption	0.8W（24V DC）	
Precision	humidity	±3%RH(60%RH,25℃)
	temperature	±0.5℃（25℃）
	Light intensity	±7%(25℃)
	CO_2	±(40ppm+ 3%F ・S) (25℃)
Operating temperature	-10℃~+50℃	
Working humidity	0%RH~80%RH	
Light intensity range	0-65535 Lux; 0-20 million Lux	
Temperature and humidity range	-40℃~+60℃， 0%RH~80%RH	
CO_2 range	0~5000ppm	
Long-term stability	temperature	≤0.1℃/y
	humidity	≤1%/y
	Light intensity	≤5%/y
	CO_2	Stability: <2%FS Non-linearity: <1%FS
Response time	temperature	≤18s (1m/s wind speed)
	humidity	≤6s (1m/s wind speed)
	Light intensity	0.1s
	CO_2	≤90s
output signal	RS485 (Modbus protocol)	
Preheat time	2min (available), 10min (maximum accuracy)	
Data update interval	2s	

1.4product model

GZ01				Illumination CO_2 temperature and humidity integrated transmitter
	N01-			RS485 (M0dbus protocol)
		2-		Wall-mounted king-shaped shell with built-in probe
			65535	Illumination range 0~65535Lux
			20W	Illumination range 0~200000Lux

1.5System frame diagram



System scheme block diagram

2. Equipment installation instructions

2.1 Inspection before equipment installation

Equipment List:

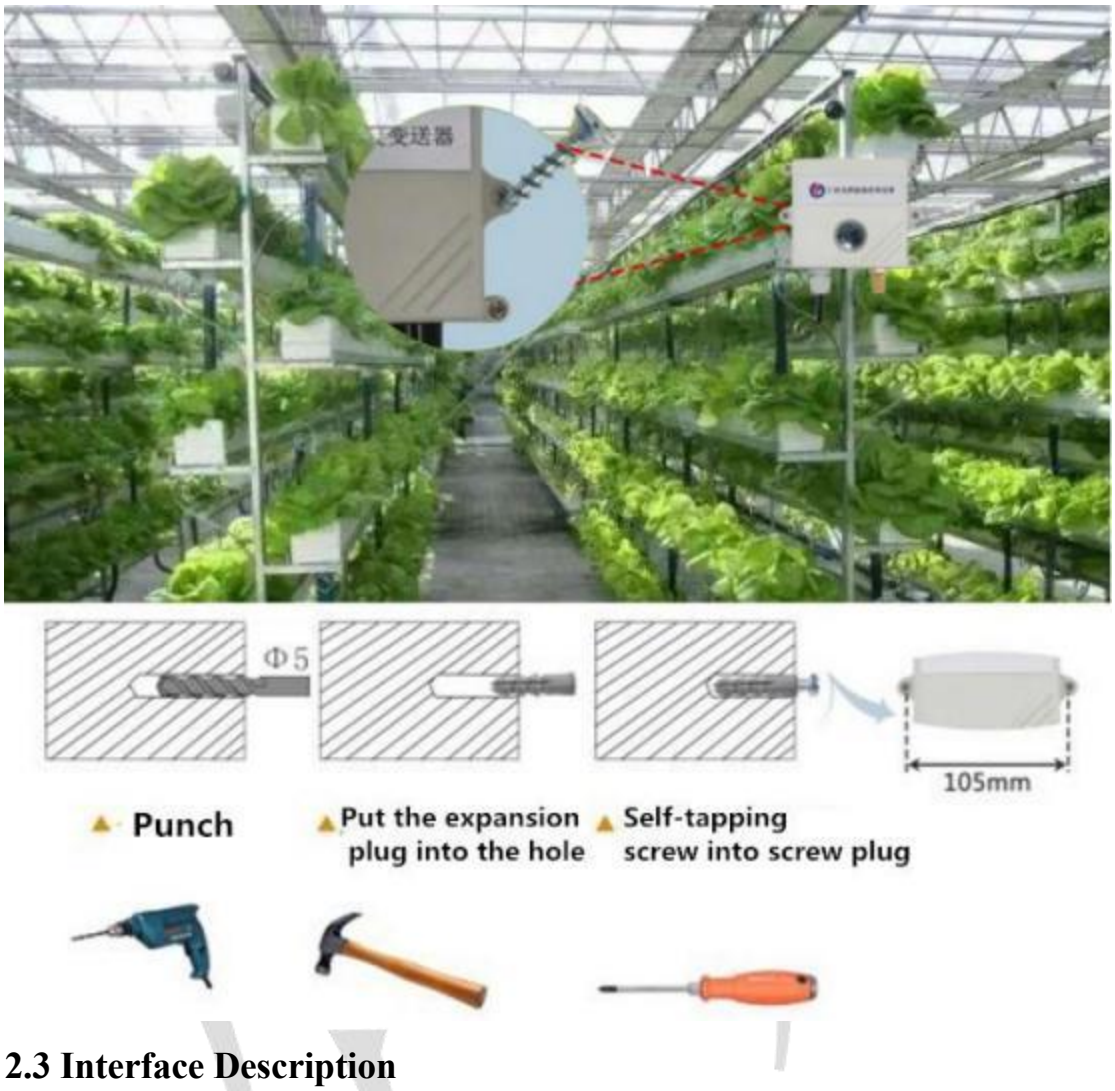
■1 set of GZ01 CO_2 temperature and humidity transmitter equipment

■Self-tapping scre GZ01 (2 pcs), expansion plugs (2 pcs)

■Product Certificate, Warranty Card

■USB to 485 (optional)

2.2 Installation step instructions



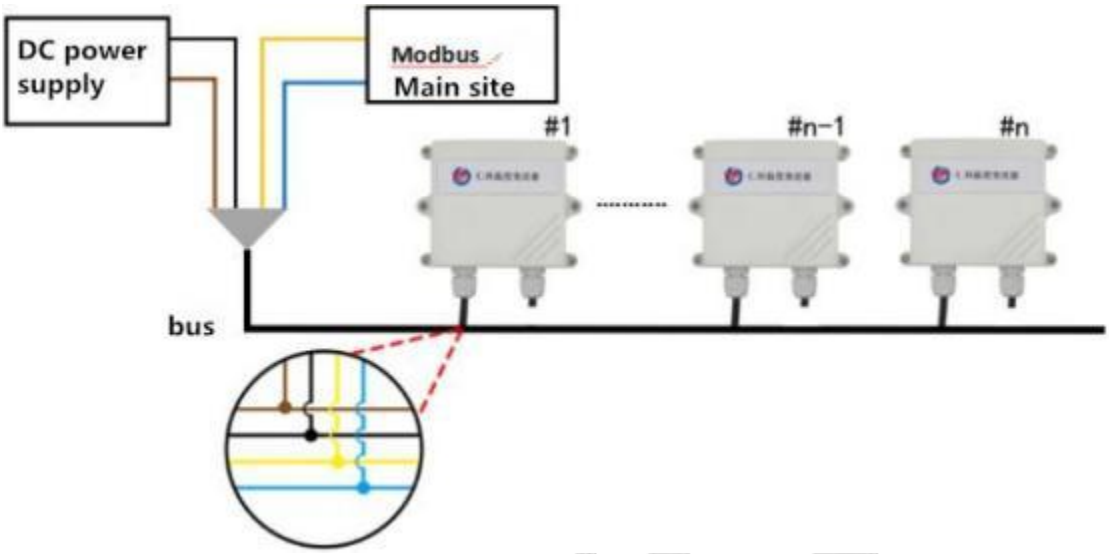
2.3 Interface Description

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 be conflicted.

	Thread color	Description
Electricity source	brown	Positive power supply (10~30V DC)
	black	Power negative
through letter	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 information package.



3. Configuration software installation and use

3.1 Software selection

Open the data package, select "Debug software" --- "485 parameter configuration software",

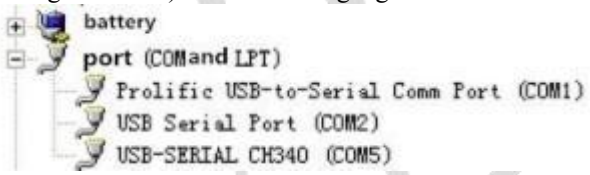


find Just

open it.

3.2 parameter settings

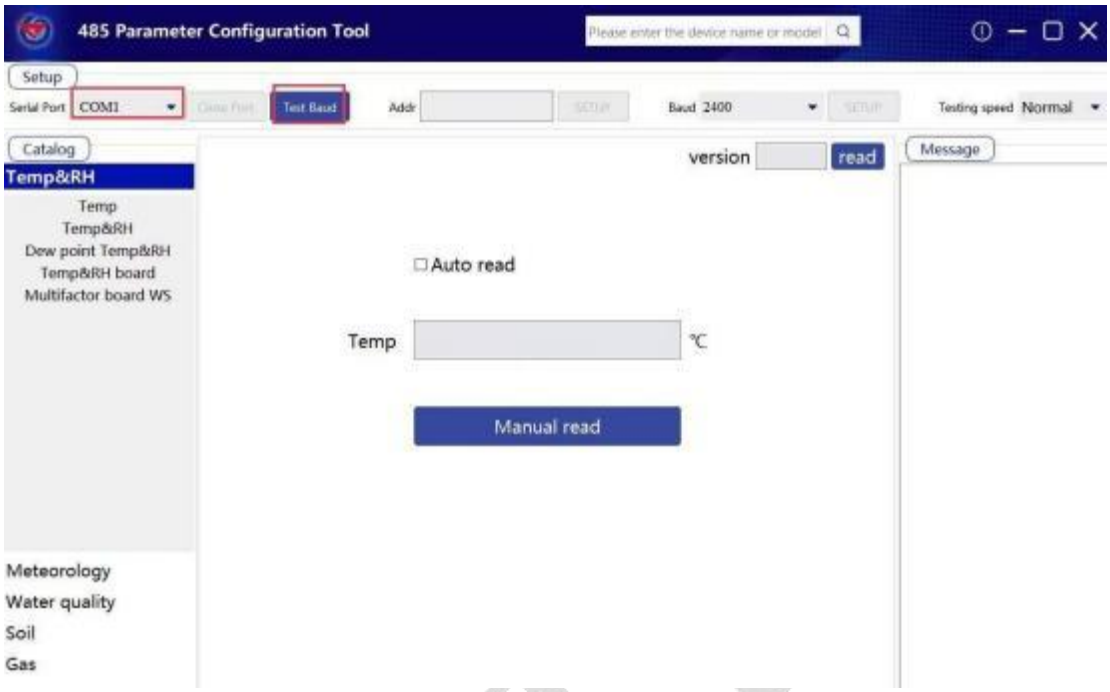
①. Select the correct COM port (check the COM port in "My Computer—Properties—Device Manager—Port"). The following figure lists the driver names of several different 485 converters.



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, you can 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 checking	CRC (Redundant Cyclic Code)
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 of 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 the

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	High bit of check code
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave machine response frame structure:

address code	function code	Number of valid bytes	Data area	Second data area	Nth data area	Check code
1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes

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	CO_2 concentration value	Read only	0~5000
0003 H	40004	0~65535 range light value or 0~200,000 range illumination value high 16 bits	Read only	0~65535
0004 H	40005	0~200,000 range illumination value lower 16 bits	Read only	0~65535
0050H	40051	Temperature calibration value	Read and write	-400~1000
0051 H	40052	Humidity calibration value	Read and write	-400~1000
0052 H	40053	CO_2 calibration value	Read and write	-2000~2000
0053 H	40054	0~65535 range illumination value	Read and	-32768~32767

		calibration value or 0~200,000 range illumination value high 16-bit calibration value	write	
0054H	40065	0~200,000 range illumination value low 16-bit calibration value	Read and write	-32768~32767
07D0 H	42001	Device address	Read and write	1~254 (factory default 1)
07D1H	42002	Device baud rate	Read and write	0 means 2400 1 means 4800

4.4 Communication protocol example and explanation

4.4.1 Read the address and baud rate of the device with address 0x01

Inquiry frame (for example: the address is 0x01 and the baud rate is 4800)

address code	function code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x03	0x07 0xD0	0x00 0x02	0xC4	0x86

Reply frame

address code	function code	Number of valid bytes	Baud rate	address	Check code low bit	High bit of check code
0x01	0x03	0x04	0x00 0x01	0x00 0x01	0x6A	0x33

4.4.2 Change address

Inquiry frame (assuming that the modified address is 0x02 Note: power off and restart the device after modifying the address)

address code	function code	initial address	Modify value	Check code low bit	High bit of check code
0x01	0x06	0x07 0xD0	0x00 0x02	0x08	0x86

Reply frame

address code	function code	initial address	Modify value	Check code low bit	High bit of check code
0x01	0x06	0x07 0xD0	0x00 0x02	0x08	0x86

4.4.3 Modify the baud rate of address 0x01

Inquiry frame (assuming to modify the baud rate to 9600. Note: power off and restart the device after modifying the address)

address code	function code	initial address	Modify value	Check code low bit	High bit of check code
0x01	0x06	0x07 0xD1	0x00 0x02	0x59	0x46

Reply frame

address code	function code	initial address	Modify value	Check code low bit	High bit of check code
0x01	0x06	0x07 0xD1	0x00 0x02	0x59	0x46

4.4.4 Read the CO_2 value of the device address 0x01

Interrogation frame

address code	function code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x03	0x00 0x02	0x00 0x01	0x25	0xCA

Response frame (for example, read CO_2 is 3000ppm)

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

CO2：

BB8 H (hexadecimal) =3000 => CO_2=3000 ppm

4.4.5 Read the temperature and humidity, CO_2 value and light value of the device address 0x01 (taking 200,000 Lux range as an example)

Interrogation frame

address code	function code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x03	0x00 0x00	0x00 0x05	0x85	0xC9

Response frame (for example, temperature value -7.5 ℃ , humidity value 35.9%, CO_2 value 3000ppm, light value 500Lux)

address code	function code	Number of bytes	Humidity value	Temperature value	CO_2	High illumination 16 bits	Low 16 bits of light	Check code low bit	High bit of check code
0x01	0x03	0x0A	0x01 0x67	0xFF 0xB5	0x0B 0xB8	0x00 0x00	0x01 0xF4	0xF1	0xF9

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

CO_2:

BB8 H (hexadecimal) =3000 => CO_2=3000 ppm

Illumination calculation instructions:

This protocol is only used under 0~200,000 Lux range transmitters, the unit is 1Lux

1F4H (Hexadecimal) = 500 => Illuminance = 500Lux

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 defaults are 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 much or the wiring is too long, power supply should be nearby, add a 485 booster, and add a 120 Ω terminal resistance.

7) The USB to 485 driver is not installed or damaged.

8) The equipment is damaged.

6.Appendix: Shell siz

Overall size: 110×105×45mm