UBIBOT

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. In addition, the probe can also be directly connected to the power supply to display the measurement data through the LCD screen. The probe is designed with waterproof and breathable film, with the highest waterproof level up to IP65. 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. Wide voltage input，DC5-12V.
6. Standard MODBUS RTU protocol.
7. Able to accurately measure CO2 concentration.
8. The product has strong protective performance and first grade lightning protection.

Main Parameters

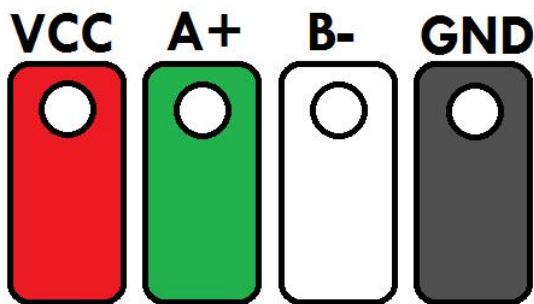| Communication Parameters	
Working Voltage	DC5V~DC12V
Measuring Range	400~10000ppm
Measuring Accuracy	CO2：3%　Accuracy(max) 0.1ppm
Output Interface	RS485
Communication Protocol	MODBUS RTU
Communication Address	0xC7

Baud Rate	1200 bit/s,2400 bit/s, 4800 bit/s, 9600 bit/s, 19200 bit/s(optional)
Standby Current	20mA
Interface Type	Audio Interface
Dimensions	65*46*29mm
Cable Length	3m

Instructions

1.RS485 should use with GS1 to have data upload function: the power supply is interface for DC12V, if device is not connected with DC12V power supply only through audio interface connected with GS1, It will be powered up while the data is being collected, and the power is then cut off after a few seconds of data collection. This does not affect the data upload function, but the LCD screen can not continue to display the data. When the device only supplies power through DC12V interface, it is in an offline state. The LCD screen of the device normally refreshes data, but data cannot be uploaded through GS1 or other devices. It will work only when the RS485 interface is connected to and power supply of DC12V interface.

2.The LCD display is refreshed once by default (4s), and the backlight is always bright by default (it can be set by RS485).

3. When measuring CO2 concentration, try to place the probe in the CO2 gas flow environment, and pay attention to the x10 and x100 marks in the upper right corner when the LCD screen displays.

4.Wiring Instruction：

Communication protocol

1.All communication circuits shall follow the master/slave mode. In this way, data can be transferred between one primary station (e.g., PC) and multiple sub-stations.No communication should start from a substation.

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

3.Compliance with MODUBS RTU protocol standards.

4.The default baud rate is 9600 and the address is 0xC7.

* 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							
Address	Function Code	Starting Address MSB	Starting Address LSB	No. Of Registers MSB	No. Of Registers LSB	CRC16 LSB	CRC16 MSB
0xC7	0x03(read)	RegAddr_H	RegAddr_L	Data_H	Data_L	CRC16_L	CRC16_H
0xC7	0x06(write)	RegAddr_H	RegAddr_L	Data_H	Data_L	CRC16_L	CRC16_H

Response Message from Slave								
Address	Function Code	Byte Count	Data1 MSB	Data1 LSB	Data2 MSB	Data2 LSB	...	CRC16LSB	CRC16MSB
0xC7	0x03(read)	BytesLenth	Data1_H	Data1_L	Data2_H	Data2_L	...	CRC16_L	CRC16_H

Address	Function Code	Starting Address MSB	Starting Address LSB	No. Of Registers MSB	No. Of Registers LSB	CRC16 LSB	CRC16 MSB	Address	Function Code
0xC7	0x06(write)	RegAddr_H	RegAddr_L	Data_H	Data_L	CRC16_L	CRC16_H	0xC7	0x06(write)

Internal Message Information

Read Function Code：0x03 (0x04) Write Function Code：0x06(0x10)				
Data Starting Address (hexadecimal)	Data	Byte Count	Unit	Comments
0x0004	CO2 Value	2	1ppm	Probe error whrn data is 0x7fff
0x0005	CO2 module temperature value	2	0.1℃	Probe error whrn data is 0x7fff
0x0006	CO2 module humidity value	2	0.1%rh	Probe error whrn data is 0x7fff
... ...				
0x0064	Device Communication Address	2	-	Can be set:1~247.Default0x00C7.
0x0065	Baud Rate	2	-	The Baud Rate code is: 0~4 0:1200 1:2400 2:4800 3:9600 4:19200
0x006A	Screen refresh time	2	0.065s	Unit：0.065s Max:65535*0.065 = 4260s

0x006B	Backlight of screen	2	-	1 for the backlight is always bright，0 for the backlight off
0x0088	Version	2	-	-

e.g.

1. Read Command：

Query Message from Master：

Address	Function Code (Read)	Starting Address MSB	Starting Address LSB	No. Of Registers MSB	No. Of Registers LSB	CRC16 LSB	CRC16 MSB
0xC7	0x03	0x00	0x00	0x00	0x07	0x15	0x6E

Response Message from Slave (Probe)：(Temperature：30.1℃, Humidity83.1%, Light 302Lux, CO2 Value：1802ppm，CO2 module temperature ：30.5℃, CO2 module humidity：82.5%)

Address	Function Code (Read)	Byte Count	Data 1 MSB	Data 1 LSB	Data 2 MSB	Data 2 LSB	Data 3 MSB	Data 3 LSB	Data 4 MSB
0xC7	0x03	0x0E	0x01	0x2D	0x03	0x3F	0x00	0x00	0x01

Data 4 LSB	Data 5 MSB	Data 5 LSB	Data 6 MSB	Data 6 LSB	Data 7 MSB	Data 7 LSB	CRC16 LSB	CRC16 MSB
0x2E	0x07	0x0A	0x01	0x31	0x03	0x39	0xFD	0xDD

2. Write Address Command：

Query Message from Master： （Change default address 0xC7 to 0x08）

Address	Function Code (write)	Register Address MSB	Register Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xC7	0x06	0x00	0x64	0x00	0x08	0xD8	0xB5

Response Message from Slave：

Address	Function Code (write)	Register Address MSB	Register Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xC7	0x06	0x00	0x64	0x00	0x08	0xD8	0xB5

3. Read version number command：

Query Message from Master： (Address is C7， read its version number)

Address	Function Code (Read)	Register Address MSB	Register Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xC7	0x03	0x00	0x88	0x00	0x01	0x15	0x46

Response Message from Slave： (If its version number is v08)

Address	Function Code (Read)	Byte Count	Data 1 MSB	Data 1 LSB	CRC16 LSB	CRC16 MSB
0xC7	0x03	0x02	0x00	0x08	0x31	0x93

4. Backlight off command：

Query Message from Master：

Address	Function Code (write)	Register Address MSB	Register Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xC7	0x06	0x00	0x6B	0x00	0x00	0xE9	0x70

Response Message from Slave：

Address	Function Code (write)	Register Address MSB	Register Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xC7	0x06	0x00	0x6B	0x00	0x00	0xE9	0x70
Response							
Address	Function Code	Starting Address MSB	Starting Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xFE	0x06						

5. Set the LCD screen refresh time： (address: 0xC7， change the default 4s refresh time to 2s)

Query Message from Master：

Address	Function Code (write)	Register Address MSB	Register Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xC7	0x06	0x00	0x6A	0x00	0x1F	0xF9	0x78

Response Message from Slave:

Address	Function Code (write)	Register Address MSB	Register Address LSB	Data MSB	Data LSB	CRC16 LSB	CRC16 MSB
0xC7	0x06	0x00	0x6A	0x00	0x1F	0xF9	0x78