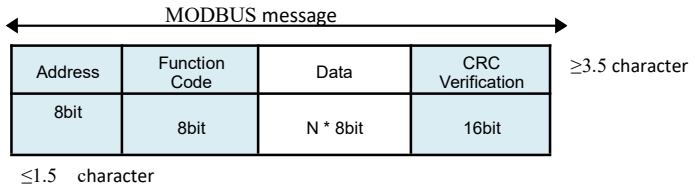


Temperature and Humidity Communication Protocol

The protocol runs on the RS485 hardware platform, and can realize remote one-to-many control and signal acquisition through the 485 bus. The communication protocol is implemented in accordance with the ModBus RTU standard protocol.

1. Character Format

Start: 1Bit
 Data: 8Bit ≥ 3.5 character
 Parity: None
 Stop: 1Bit
 Baud Rate: 9600 bps, 19200 bps



In RTU mode, the interval between two characters must be less than 1.5 character time, otherwise the message frame is considered incomplete and the receiving station discards the message frame. The interval between two message frames is at least 3.5 character time.

2. Communication Protocol

1. Slave ID address

The slave ID address is the identification number of each slave. The default value of this machine is 0x01, which can be modified by modifying the register value. The modification range is 0x01~0xFF.

2. Read holding register (function code 0x03)

The host can use this function to read data from the slave register, and can read one or more registers at the same time.

Sequence Format:

The Host Sends a Read Request Sequence					
0S Slave ID address	Function code=0x03	Register start address	Number of read registers	CR Low order	CR High order
8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Slave normal response sequence					
Slave ID address	Function code=0x03	Number of data bytes n	Data	CR Low order	CR High order
8Bit	8Bit	8Bit	N * 8Bit	8Bit	8Bit
Slave error response sequence					
Slave ID address	Error Code=0x83	Exception code = 0x02 or 0x03		CR Low order	CR High order
8Bit	8Bit	8Bit		8Bit	8Bit

Communication code example

Host send sequence:	01	03	0001	00 01	D5 CA
	Slave ID	Function code	Register starting position	Number of read registers	CRC verification
Slave normal response sequence:	01	03	04	03 E8 00 01	BB 83
	Slave ID	Function code	Data length	Data	CRC verification
Slave error response sequence:	01	83	02	C0 F1	
	Slave ID	Function code	Data length	CRC verification	

1. Write a single register (function code 0x06)

The host can write data to the slave register through this function, and can only operate on a single register. Sequence format:

The host sends and writes a single register sequence					
Slave ID Address	Function code = 0x06	Register address	Write register value	CRC Low order	CRC High order
8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Slave normal response sequence					
Slave ID Address	Function code = 0x06	Register address	Write register value	CRC Low order	CRC High order
8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Slave error response sequence					
Slave ID Address	Error Code = 0x86	Exception code = 0x02 or 0x03		CRC Low order	CRC High order
8Bit	8Bit	8Bit		8Bit	8Bit

Communication code example

Host send sequence:	01	06	0003	00 01	B8 0A
	Slave ID	Function code	Register address	Value written to register	CRC verification
Slave normal response sequence:	01	06	00 03	00 01	B8 0A
	Slave ID	Function code	Register address	Value written to register	CRC verification
Slave error response sequence:	01	86	02	C3 A1	
	Slave ID	Function code	Data length	CRC verification	

3. Register address reference table

Register address	Register definition	Reading and writing method	Specific function description
0x0001	Temperature data	Read only	Temperature output range -40.00~99.99 °C. Example reading 0x00000000 = 0.00°C, 0x41200000 = 10.00°C, 0x41A00000 = 20.00°C; When the temperature value is negative: 0xC1A00000 = -20.00°C
0x0002	Temperature data	Read only	Humidity output range 00.00~99.99 %. Example reading 0x00000000 = 0.00%, 0x41200000 = 10.00%, 0x41A00000 = 20.00%
0x0003	Communication rate setting	Can read and write	1=9600bps 2=19200bps 3=38400bps 4=115200bps default: 1
0x0004	Slave ID address setting	Can read and write	Can set 0x01~0xFF, default: 0x01
0x0005	Reserved	Can read and write	
0x0006	Reserved	Can read and write	
0x0007	Reserved	Can read and write	

4. Exception code analysis

0x02	Abnormal or wrong register address
0x03	The value written to the register is abnormal or wrong

5. Floating point data encoding

5.1 IEEE Floating point number standard definition

SEEEEEEE	EMMMMMMM	MMMMMMMM	MMMMMMMM
Byte1	Byte2	Byte3	Byte4

S...Sign

E...Exponent

M...23 Bit Mantissa