

RS-485 Modbus Communication protocol

The sensor uses ModBus-RTU protocol to communicate. The protocol is a master-slave communication, and a master, a slave computer can be connected with multiple slave computers, and each slave computer has a unique address to identify its identity. Code to realize the content to be read/written. As a simple application, it mainly involves 0x03 read-and-hold relay. Function code, 0x06 preset single relay function code.

Read and hold relay function code 0x03

When the host sends the 03 function code, it indicates that it mainly wants to obtain the content of a certain register from the slave. A complete command includes the data sent by the host and the data replied by the slave. The specific parsing is as follows: Device address: 1-240
 Format of host request data message: Use 03 function code to read data, and the address can be found in the following relay list. For example: 01 03 00 00 00 04 44 09 Reading data on temperature and triaxial vibration.

Host sending		Sent messages	Remark	
Slave address	1	XX	To the slave data with address XX	01 slave address
Function code	1	03	Read Register	03
Start address	2	0000	Starting address is 0000	0000 data start address
Data Length	2	00XX	Read XX data (2XX bytes in total)	0004 read 4 data
CRC Code	2	XXXX	CRC code calculated by the host	44 09 CRC check code

Format of transmitter response command message:

Ex : 01 03 08 00 1A 00 02 00 03 00 04 A6 15

Slave response	Bytes	Return	Remark	Instruction Description
	Number	Message		
Slave address	1	XX	From the slave with address XX.	01 Slave number
Function code	1	03	Read register	03 function code
Data Length	1	XX	XX bytes (2 times the number of data)	08, 8 bytes of data
Register data 1	2	DAT1	Transmitter parameter 1 data content	00 1A temperature value 26
...	00 02 Vibration value 2
Register data N	2	DATN	Transmitter parameter n data content	00 04 Vibration value 4
CRC Code	2	XXXX	Calculated by the slave computer.	A6 15 CRC of returned data

When the slave receives the CRC verification code of the host and the CRC verification code calculated by the slave. Inconsistencies do not affect the host.

Preset single register function code 0x06

The 06 function code is used by the host to write data to a relay of the slave, and can only operate one relay at a time. The example of data sent by the host is as follows:

Host sending: 01 06 00 06 00 04 68 08

Response data: 01 06 00 06 00 04 68 08

The meaning of data and bytes sent by the host: 01 06 refers to the host number and function code, and 00 06 refers to the relay to be written, 00 04 refers to the numerical value written. 68 08 is the calculated CRC verification code. This instruction modifies the host number to 4.

Instructions used to modify the baud rate, such as:

Host sending: 01 06 00 07 00 0A B8 0C

Response data: 01 06 00 07 00 0A B8 0C, modify the baud rate of the host to 115200

The meaning of data and bytes sent by the host: 01 06 refers to the host number and function code, and 00 07 refers to the relay to be written, 00 0A refers to the numerical value written. B8 0C is the calculated CRC verification code, and the baud rate of the modified host is 115200. The function code, the data replied by the slave and the data sent by the host are consistent.

Data transmission mode:

Asynchronous 10 bits -1 start bit (0), 8 data bits, 1 stop bit (1), no parity bit.

Data transmission rate:

Factory standard baud rate 9600BPS, host number 1, special host number 250

(not supported for normal use) Temperature change rate

The standard is 0.3 °C, the setting range is 0.3-10.0 °C, and data outside the range is 0.3 °C.

The temperature value read is,

The vibration value and temperature change rate are both 10 times the normal data, and in actual display, the temperature needs to be divided by 10 to display.

The list of relays used in this transmitter is as follows:

Address	Description	Data type	Attribute
0x0000	Temperature value	short	R
0x0001	Axis data	short	R
0x0002	Y-axis data	short	R
0x0003	Z-axis data	short	R
0x0004	Not useful	short	R
0x0005	Not useful	short	R
0x0006	Host number	Unsigned short	R/W
0x0007	Serial port baud rate	Unsigned short	R/W
0x0008	Temperature change rate	Unsigned short	R/W

The comparison table of baud rate and written values for the serial port of this transmitter is as follows:

Value	Baud rate	Value	Baud rate
1	1200	6	19200
2	2400	7	38400
3	4800	8	56000
4	9600	9	57600
5	14400	10	115200

Note: When the device address is forgotten, the device address can be read using the following command: FA 03 00 06 00 01 71 80