

MODBUS

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

一、 Character format

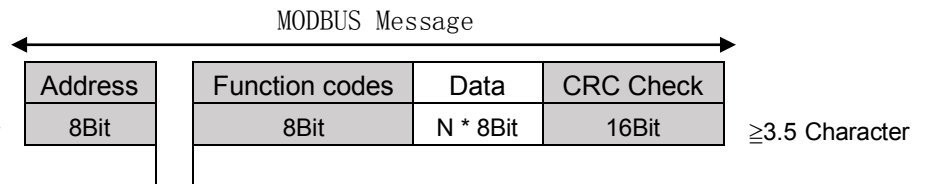
Start: 1Bit

Data: 8Bit

Parity : None ≥ 3.5 Character

Stop: 1Bit

Baud Rate: 9600 bps、19200 bps ≤ 1.5 Character



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

二、 Communication protocol

1. Slave ID address

The Slave ID address is the identity number of each slave, with a default value of 0x01 for native and a modification range of 1-63, where 0x00 is the broadcast receive address. It can be adjusted by modifying the ID dial switch, the adjustment results for ID dial.

2. Read hold register (function code 0x03)

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

Sequence format:

The host sends a sequence of read requests						
	Slave ID address	Function codes	Register start address	Read the number of registers	CRC Low	CRC High
	8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Code examples	0x01	0x03	0x00 0x01	0x00 0x02	0x95	0xCB
Slave normal response sequence						
	Slave ID address	Function codes	Number of data bytes N	Data	CRC Low	CRC High
	8Bit	8Bit	8Bit	N * 8Bit	8Bit	8Bit
Code examples	0x01	0x03	0x04	0x03 0xE8 0x00 0x01	0xBB	0x83
Slave error response sequence						
	Slave ID address	Error code	Exception Code = 0x02 / 0x03		CRC Low	CRC High
	8Bit	8bit	8Bit		8Bit	8Bit
Code examples	0x01	0x83	0x02		0xC0	0xF1

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

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

Sequence format:

The host sends and writes a sequence of individual registers						
	Slave ID address	Function codes = 0x06	Register address	Writes a register value	CRC Low	CRC High
	8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Code examples	0x01	0x06	0x00 0x03	0x00 0x01	0xB8	0x0A
Slave normal response sequence						
	Slave ID	Function codes	Register	Writes a register value	CRC Low	CRC High

	address	= 0x06	address			
	8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Code examples	0x01	0x06	0x00 0x03	0x00 0x01	0xB8	0x0A
Slave error response sequence						
	Slave ID address	Error code = 0x86	Exception Code = 0x02 / 0x03		CRC Low	CRC High
Code examples	0x01	0x86	0x02		0xC3	0xA1

4. Broadcast write register (function code 0x06)

The host can write register data to all the slave on the bus through this function, and the Slave ID address is unified as 0x00. No response from the slave.

Sequence format:

Host sends broadcast write register sequence						
	Slave ID address = 0x00	Function codes = 0x06	Register address	Writes a register value	CRC Low	CRC High
	8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Code examples	0x00	0x06	0x00 0x05	0x00 0x01	0x59	0xDA
No response from the slave						

Note:

In addition to the ability to group all the slave computers on the bus, you can also modify the slave address directly without knowing the slave ID address, so use with caution, to avoid a situation where all the slave ID addresses on the bus are changed to the same address.

三、Register address reference table

Register address	Register definition	Reading and writing	Specific function description
0x0001	Pressure data	Read only	1. The pressure output range is -1000~1000Pa、-10000~10000Pa, the resolution is 1Pa. The example read values are 0x0000 = 0Pa、0x03E8 = 1000Pa; When the pressure value is negative = $-(0x10000 - n(\text{Read value}))$, that is 0xFFFF = -1Pa、0xFC18 = -1000Pa 2. The pressure output range is -100~100Pa, the resolution is 0.1Pa. When the pressure value is positive = $n(\text{Read value})/10$, The example read values are 0x0001 = 0.1Pa、0x03E8 = 100.0Pa; When the pressure value is negative = $-(0x10000 - n(\text{Read value}))/10$, The example read values are 0xFFFF = -0.1Pa、0xFC18 = -100.0Pa
0x0002	Unit settings	Readable and writable	1=Pa 2=mmH ₂ O 3=mbar 4=inWG 5=mmHG 6=daPa 7=Kpa 8=hPa (Available with a display screen) Default: 1
0x0003	Response time settings	Readable and writable	1=0.5s 2=1s 3=2s 4=4s Default: 1
0x0004	Communication mode setting	Readable and writable	1=9600bps 2=19200bps Default: 1
0x0005	From the Machine ID address setting	Read only	Dial switch settings are available 1~64, Default: 0x01
0x0006	Zero operation	Readable and writable	Write 1234(0x04D2) for a clean-up operation, reading a pressure value

四、Exception code resolution

0x02	A register address exception or error
0x03	An exception or error was written to the register

五、Communication configuration

Connection Setup

Connection: Serial Port

Serial Settings: USB Serial Port (COM3)

9600 Baud

8 Data bits

None Parity

1 Stop Bit

Advanced...

Mode: RTU ASCII

Response Timeout: 100 [ms]

Delay Between Polls: 20 [ms]

Remote Modbus Server

IP Address or Node Name: 127.0.0.1

Server Port: 502

Connect Timeout: 3000 [ms]

IPv4 IPv6

OK

Cancel

Read/Write Definition

Slave ID: 1

Function: 03 Read Holding Registers (4x)

Address: 1 PLC address = 40002

Quantity: 6

Scan Rate: 1000 [ms]

Apply

Disable

Read/Write Disabled

Disable on error

Read/Write Once

View

Rows: 10 20 50 100 Fit to Quantity

Hide Alias Columns PLC Addresses (Base 1)

Address in Cell Enron/Daniel Mode

Request

RTU: 01 03 00 01 00 06 94 08

ASCII: 3A 30 31 30 33 30 30 30 31 30 30 30 36 46 35 0D 0A

OK

Cancel