

500 Series Liquid level -RS485 Communication Protocol (MODBUS-RTU)

1.RTU data format description

1.1 Communication mode

The instrument adopts MODBUS RTU format. The protocol is used for data communication in master-slave query mode.

1.2 data format

The format of each byte in RTU mode is:

The encoding system is: 8-bit binary

Bits per byte: 1 start bit, 8 data bits (least significant bit sent first), 1 stop bit

Five baud rates are available: 2400, 4800, 9600, 19200, 115200

start	address	Function code	data	CRC check	end
≥3.5 character	8 bit	8 bit	n*8 bit	16 bit	≥3.5 character

note:

- (1) in RTU mode, an idle interval of at least 3.5 characters separates the packet frames.
- (2) The entire message frame must be sent in a continuous stream of characters.
- (3) The idle interval between two characters should not exceed 1.5 character time.

1.3 address

In the protocol, the address of the instrument is "0-255", and the "0" address is used for broadcasting, and the other addresses are reserved.

2. Command description

2.1 This instrument uses two instructions in the MODBUS protocol:

Command 03	Read a single hold register
Command 06	Write a single hold register

2.2 data format

The data format in the protocol is: floating-point number. Modbus sends the most significant word first. The protocol data encoding sequence is 3412, decoding sequence is 1234.

32 single-precision floating-point number the single format is IEEE754, equivalent to 4 bytes and the sequence is 3-4-1-2.

After decoding into the 1-2-3-4 sequence, the 31st, 30th, 29th, ..., and 0 bits from the highest to the lowest are respectively.

The 31 bits are the sign bits(S), where 1 means the number is negative and 0 is positive; 30-23 bits, a total of 8 bits is the level code; 22-0 digits, a total of 23 digits is mantissa.

The format of command 03 is as follows: (read register command)

note:

MODBUS request

Instrument address	1 BYTE	01-255
Function code	1 BYTE	0x03
Start address	2 BYTE	0-FFFF
Read quantity	2 BYTE	1-12
CRC low-order	1 BYTE	
CRC high-order	1 BYTE	

MODBUS response

Instrument address	1 BYTE	01-255
Function code	1 BYTE	0x03
Byte count	1 BYTE	
Input state	N*2 BYTE	
CRC low-order	1 BYTE	
CRC high-order	1 BYTE	

Command 06 format is as follows (write register command):

Clears the value of total accumulated traffic

MODBUS request

Instrument address	1 BYTE	01-255	
Function code	06	0x06	
Byte count	1 BYTE		

MODBUS response

Instrument address	1 BYTE	01-255	
Function code	06	0x06	
Byte count	1 BYTE		

Description of communication:

Configuration instructions (power off and then power on after changing the address or baud rate)

sequence	Explain	value
Address (id)	Address(default is 1,can be modified)	example: 0001
baud	9600 (revisibility)	2400-115200

Baud=0 r485_baud= 2400

Baud=1 r485_baud=4800

Baud=2 r485_baud=9600

Baud=3 r485_baud=19200

Baud=4 r485_baud=115200

Data item definition (485 scan speed should not be less than 200ms)

sequence	Instructions
40001	No
40002	Display the Liquid level value
40003	Number of decimal points in Liquid level value