

# Modbus RTU Communication Protocol for Instrument and PC

## 1. Interface Specifications

To monitor or control instruments together by PC or PLC controlled machine, our meters provide RS232 and RS485 two digital communication interfaces by optical coupling isolation technique. PC controlled machine which adopts RS232 communication interface can only pick up a meter by three lines at a transmission range of about 15 meters; while PC controlled machine which adopts RS485 communication interface and needs match a RS232-485 converter can pick up at most 64 instruments by two lines at a transmission range of about a kilometer.

## 2. Communication Protocol

(1) There are four adjustable communication baud rates in the data format of a starting position, eight data bits, 2-stop bits and no parity as follows: 1200, 2400, 4800, and 9600.

(2) PC read a parameter (2 bytes)

Instrument No.	Function Code (03)	the First Parameter Address	Read Words (0001)	CRC16
1byte	1 byte	2bytes	2 bytes	2 bytes

(3) Instrument returns (2 bytes)

Instrument No.	Function Code (03)	the Number of Read Bytes (02)	Parameter Value	CRC16
1byte	1 byte	1 byte	2 bytes	2 bytes

(4) PC write a parameter (2 bytes) and instrumentation return (2 bytes) (frame format the same) :

Instrument No.	Function Code (6)	the First Parameters Address	Parameter Value	CRC16
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Function code	Function and significance	Detailed led description
0x03	Read meter internal data	Read meter internal data
0x04	Reading measurement data	pending measurement data
0x06	Write internal data to instrument	Write internal data to instrument

**measured value:0x00**

## 3. Note

1) When the host computer writes data to the instrument, programs should add parameters amplitude limit function in the forms of instrument specifications, in case of data written in instrument is beyond its limit, resulting in the meter does not work. As regard to the parameters and scope of the code, please refer to the instrument instruction.

2) PC issues a read or written instruction interval should be greater than or equal to 0.2 seconds, because the short interval will make the instrument too late to answer the instruction.

3) If the meter does not send the decimal information, when PC program compiled, the instrument should be set according to needs.

4) The measured 32767 value (7FFFH) represents HH (over the upper measuring range), while the measured 32512 (7F00H) value indicates LL (over the lower measuring range).

5) In addition to the CRC check bytes, all other double-bytes are high-byte sequence in front, low byte order after.

Register address	Symbolic description	Register address	Symbolic description
		01H	ALM1
02H	ALM2	03H	Hy-1
04H	Hy-2	05H	Hy
06H	At	07H	I
08H	P	09H	D
0AH	t	0BH	Sn
0CH	dp	0DH	P-SL
0EH	P-SH	0FH	Pb
10H	OP-A	11H	out
12H	outH	13H	AL-P
14H	CoolL	15H	BAud
16H	Addr	17H	FILt
18H	A-M	19H	Lock

1AH	C1	1BH	T1
1CH	C2	1DH	T2
1EH	C3	1FH	T3
20H	C4	21H	T4
22H	C5	23H	T5
24H	C6	25H	T6
26H	C7	27H	T7
28H	C8	29H	T8
2AH	C9	2BH	T9
2CH	C10	2DH	T10
2EH	C11	2FH	T11
30H	C12	31H	T12
32H	C13	33H	T13
34H	C14	35H	T14
36H	C15	37H	T15
38H	C16	39H	T16
3AH	C17	3BH	T17
3CH	C18	3DH	T18
3EH	C19	3FH	T19
40H	C20	41H	T20
42H	C21	43H	T21
44H	C22	45H	T22
46H	C23	47H	T23
48H	C24	49H	T24
4AH	C25	4BH	T25
4CH	C26	4DH	T26
4EH	C27	4FH	T27
50H	C28	51H	T28
52H	C29	53H	T29
54H	C30	55H	C30

The following registers are read-only

56H	Run time of current section	00H	Current run segment
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