

Specification

Modbus

Ultrasonic water meter

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1. Protocol description

- RS485 meter reading, communication use 4 core cable
- RS485: A(Yellow), B(Green), power+(Red, DC7-24V), GND(Black)
- Load limit:64 meters
- Communication distance:800m
- Baud rate(adjustable)2400bps, EVEN, 8, 1
- Character interval:4ms
- All plaintext transmission, no encryption
- Check: CRC-16/modbus, $x_{16}+x_{15}+x_2+1$

2. Modbus Command code description

2.1.Meter Reading

Mod-ID	03	RegisterID-High	RegisterID-Low	RegisterNO.-High	RegisterNO.-Low	CRC-High	CRC-Low
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Request command code description:

Modbus: 0x01
Command code: 0x03
Register start ID-High: 0x00
Register start ID-Low: 0x01
Register ID numbers-High: 0x00
Register ID numbers-High: 0x26
CRC check high: 0x95
CRC check low: 0xD0

Response code description:

Modbus ID: 0x7D
Command code: 0x03
Register numbers: 0x4C
Register ID 1: 0x614E
Register ID 2: 0x00BC 0x00BC614E change to Decimal is 12345678
Register ID 3: 0x0B3B Named Instantaneous flow 12345678L/h

Register ID 4: 0X614E
Register ID 5: 0X00BC 0x00BC614E change to Decimal is 12345678
Register ID 6: 0x0C13 Named last month consumption 12345.678 m3,
0X0C13 means 0.001m³ (DN15-40)
0X0C15 means 0.1m³ ($\geq$ DN50)

Register ID 7: 0x614E
Register ID 8: 0x00BC 0x00BC614E change to Decimal is 12345678
Register ID 9: 0x0C13 Named forward flow 12345.678 m3

Register ID 10:	0x614E	
Register ID 11:	0x00BC	0x00BC614E change to Decimal is 12345678
Register ID 12:	0x0C13	Named reverse flow 12345.678 m3
Register ID 13:	0x0000	Reserved
Register ID 14:	0x0000	Reserved
Register ID 15:	0x0000	Reserved
Register ID 16:	0x0000	Reserved
Register ID 17:	0x0000	Reserved
Register ID 18:	0x0000	Reserved
Register ID 19:	0x0123	Pressure, 0x0123 change to Decimal is 291, so pressure is 0.291Mpa (only for pressure meter)
Register ID 20:	0x0000	meter status register, no alarm
	0x0004	meter status register, empty alarm
	0x0020	meter status register, low battery alarm
Register ID 21:	0x614E	
Register ID 22:	0x00BC	Cumulative working time 12345678h
Register ID 23:	0x4932	Minute value is 49 and second value is 32
Register ID 24:	0x1001	Day value is 10 and hour value is 01
Register ID 25:	0x1903	Year value is 19 and month value is 03 So, the date&time is 10/03/2019 01:49:32
Register ID 26:	0x0000	Reserved
Register ID 27:	0x0000	Reserved
Register ID 28:	0x0000	Reserved
Register ID 29:	0x0000	Reserved
Register ID 30:	0x0000	Reserved
Register ID 31:	0x0A9B	Temperature 27.15°C (HEX to decimal)
Register ID 32:	0x0000	Reserved
Register ID 33:	0x5678	
Register ID 34:	0x1234	BCD, meter serial number is 12345678
Register ID 35:	0x0001	BCD, Modbus ID is 01
Register ID 36:	0x0000	Reserved
Register ID 37:	0x0000	Modbus Baud Rate is 9600bps

0x0001 Modbus Baud Rate is 2400bps
 0x0002 Modbus Baud Rate is 4800bps
 0x0003 Modbus Baud Rate is 1200bps

Register ID 38: 0x0000 Version, Register ID ≤38

CRC check high: 0xxxxx

CRC check low: 0xxxxx CRC-16/modbus, x16+x15+x2+1

3. Change Modbus ID

CASE:

Set Modbus ID 01(HEX) send command:

Request: FE FE FE 68 20 FF FF FF FF 01 74 00 15 0A A0 18 AA FF FF FF FF 01 11 11 99 16

Response: FE FE FE 68 20 FF FF FF FF 01 74 00 95 0A A0 18 AA FF FF FF FF 01 11 11 19 16

Set Modbus ID 02(HEX) send command:

Request: FE FE FE 68 20 FF FF FF FF 01 74 00 15 0A A0 18 AA FF FF FF FF 02 11 11 9A 16

Response: FE FE FE 68 20 FF FF FF FF 01 74 00 95 0A A0 18 AA FF FF FF FF 02 11 11 1A 16

Code	Description
01 74 00	Manufacturer code need to check on the meter display (display 007401)
01/02	New modbus ID
99/9A/19/1A	Check sum from 68 20 to 11 11

4. Revision

V1.0.1 2015/1/8

+ Added Modbus water meter protocol

V1.0.2 2018/7/9

+ Modified register ID

V1.0.3 2019/3/1

+ Added baud rate description

V1.0.4 2019/3/27

+ Added Net Flow

V1.0.5 2019/9/9

+ Added bulk size meter protocol

V1.0.6 2020/4/28

+ Added revision page

V1.0.7 2020/7/27

+ Modified optional functions.

V1.0.8 2022/8/23

+ Updated the document format.

V1.0.9 2022/10/21

+Remove net flow and totalizer flow

V1.1.0 2024/8/22

+Updated address

