

MODBUS RTU , RS485 COMMUNICATION FOR PD FLOW METER

1. RTU Mode

Communication Parameters:

- Baud rate: 9600 bps
- 1 start bit
- 8 data bits
- Parity: None (configurable)
- 1 stop bit

Frame Check Field: Cyclic Redundancy Check (CRC) applied to the entire message content.

Frame Description: (Except for CRC check, all transmitted bytes are sent high byte first, then low byte)

Slave Address	Function Code	Data	CRC
1 byte	1 byte	0 to 252 bytes	2 bytes (low byte first, then high byte)

Note: Slave address range is hexadecimal 00~FF.

2. Register Address and Definition

No.	Register Address (Decimal)	Parameter Name	Data Format	Type	Notes
1	1-2	Total volume - high 6 digits	Float	Read-only	Unit: m ³ /T
2	3-4	Total volume - low 6 digits	Float	Read-only	Unit: m ³ /T
3	5-6	Total volume - 6 decimal places	Float	Read-only	Unit: m ³ /T
4	7-8	Instantaneous flow rate	Float	Read-only	Same as current unit
5	9-10	Batch total - high 4 digits	Float	Read-only	Unit: m ³ /T
6	11-12	Batch total - low 6 digits	Float	Read-only	Unit: m ³ /T
7	13-14	Batch total - 6 decimal places	Float	Read-only	Unit: m ³ /T

3. Function Codes

Master Request Frame:

Address	Function Code	Starting Address	Register Quantity	CRC Check
1 byte	1 byte (0x03)	2 bytes (1~12)	2 bytes (1~125 / 0x7D)	2 bytes

Slave Response Frame:

Address	Function Code	Byte Count	Register Values	CRC Check
1 byte	1 byte (0x03)	1 byte (2×N)	2×N bytes	2 bytes

Where N = number of registers

4. Examples

Example 1: Read Register Data (Current Display Values)

Master Request:

01 03 00 01 00 08 15 CC

- Address: 01
- Function Code: 03
- Starting Address: 00 01
- Quantity: 00 08
- CRC: 15 CC

Slave Response:

• 01 03 10	; Address, Function Code, Byte Counter
• 49 06 47 00	; Total volume - high 6 digits: 550000
• 49 74 1E 70	; Total volume - low 6 digits: 999911
• 49 73 E5 80	; Total volume - decimal places: 999000
• 41 45 85 1F	; Instantaneous flow rate: 12.345
• C2 0D	; CRC

Calculation: Total accumulated volume = $550000 \times 10^6 + 999911 + 999000/10^6 = 550000999911.999000 \text{ m}^3$

Example 2: Read Extended Register Data

Master Request:

01 03 00 01 00 0E 95 CE

- Address: 01
- Function Code: 03
- Starting Address: 00 01
- Quantity: 00 0E
- CRC: 95 CE

Slave Response:

01 03 1C	; Address, Function Code, Byte Counter
00 00 00 00	; Total volume - high 6 digits: 0
00 00 00 00	; Total volume - low 6 digits: 0
48 6F 42 00	; Total volume - decimal places: 245000
00 00 00 00	; Instantaneous flow rate: 0
00 00 00 00	; Batch total - high 4 digits: 0
00 00 00 00	; Batch total - low 6 digits: 0
47 4F 08 00	; Batch total - decimal places: 53000
EC F1	; CRC

Calculation:

- Total accumulated volume = $0 \times 10^6 + 0 + 245000/10^6 = 0.245000 \text{ m}^3$
- Batch accumulated volume = $0 \times 10^6 + 0 + 53000/10^6 = 0.053000 \text{ m}^3$

Note: This communication protocol only provides read-only functionality for current data.