

1. High-precision meter reading:

Command:

FE FE FE FE FE FE 68 (20) (AA AA AA AA AA 11 11) (01) (03) (3F 90 12) (E1) 16

Preamble: 0xFE; (same below, no further description)

Header: 0x68; (same below, no further description)

Instrument type: 0x20; (same below, no further description)

Meter number: 1111AAAAAAAAAAAA; Manufacturer code: 1111 (same below, no further description); When reading meters with high precision, send a broadcast address (except for the manufacturer code 0x1111, all other parts of the broadcast address are 0xAA, same below, no further description), and require that only one meter is connected to the current MBUS bus.

Control code: 0x01; read type; (implemented in accordance with the standard 188 protocol, the same below, no further description)

Data field length: 0x03;

Data identifier: 0x903F; (high-precision meter reading data identifier)

Serial number: 0x12;

Checksum: 0xE1

0x16: packet tail; (the same below, no further description)

Remarks: Checksum, here, the checksum is before the checksum byte (not included), after the 0x68 packet header (included), the arithmetic sum of all data is taken as the lower eight bits

Reply:

FE 68 (25) (00 00 00 00 00 11 11) (81) (3A) (3F 90 03) (26 21)① (00 00 00 00) ⑭ (00 00 00 00 2C)② (00 00 00 05)③ (00 00 00) ④ (06 00) ⑤ (00 00 00 00) ⑮ (19 07 02) ⑥ 00 00 00 00 (00 10) ⑦ (00 10) ⑧ (00 10) ⑨ (00 10) ⑩

00 00 00 00 10 04 (47 26) ⑪ 00 (01 01 17 20) ⑫ (00 00) ⑬ D6 16

The underline is the data field

①: Inlet temperature, the decimal part is in front and the integer part is in the back (BCD code), which is 21.26 in this case

②: Accumulated flow: the first four bytes are the value and the low byte is in front (BCD code), and the last byte is the unit (HEX); if the original value is 01 00 10 00, the actual flow is 00100.001

③: If the current state is heat metering, it is the accumulated heat; if the current state is cooling metering, it is the accumulated cooling; the first four bytes are the value and the low byte is in front (BCD code), and the last byte is the unit (HEX); if the original value is 01 00 10 00, the actual flow is 00100.001

④: Cumulative alarm time: low byte in front (BCD code); unit: h;

⑤: Nominal diameter: low byte in front (HEX); 0x0001 -> DN15; 0x0002 -> DN20; 0x0003 -> DN25; 0x0004 -> DN32; 0x0005 -> DN40; 0x0006 -> DN50; 0x0007 -> DN65; 0x0008 -> DN80; 0x0009 -> DN100; 0x000A -> DN125; 0x000B -> DN150; 0x000C -> DN200; 0x000D -> DN250; 0x000E -> DN300;

⑥: Pulse width;

⑦: 2.5 flow points (HEX format), low byte first, actual value divided by 4096, the actual value is 1; assuming the actual flow is Y, the read flow is X, the original coefficient of this point is Z. Then the flow coefficient of this flow point is $(Y \div X) * Z$; if $X < Y$, it means that the heat meter test result is too small, the error is $-((Y-X) \div Y)$; if $X > Y$, it means that the heat meter test result is too large, the error is $+((X-Y) \div Y)$.

⑧: 0.75 flow point (HEX format), low byte first, actual value divided by 4096, the actual value is 1; the coefficient of this point is

$(2.5 \text{ flow point coefficient} + 0.25 \text{ flow point coefficient}) \div 2$;

⑨: 0.25 flow point (HEX format), low byte first, actual value divided by 4096, the actual value is 1; assuming the actual flow is Y, the read flow is X, the original coefficient of this point is Z. Then the flow coefficient of this flow point is $(Y \div X) * Z$; if $X < Y$

Y, it means that the heat meter test result is too small, the error is $-((Y-X) \div Y)$; if $X > Y$, it means that the heat meter test result is too large, the error is $+((X-Y) \div Y)$.

⑩: 0.05 flow point (HEX format), low byte first, actual value divided by 4096, the actual value is 1; assuming the actual flow is Y, the read flow is X, the original coefficient of this point is Z. Then the flow coefficient of this flow point is $(Y \div X) * Z$; if $X < Y$, it means that the heat meter test result is too small, the error is $-((Y-X) \div Y)$; if $X > Y$, it means that the heat meter test result is too large, the error is $+((X-Y) \div Y)$.

⑪: outlet temperature, decimal part first, integer part last (BCD code), here is 21.47

⑫: date code low byte first (BCD code), here is 20170101;

⑬: meter status low byte first (HEX);

⑭: number of pulses;

⑮: zero point difference; low byte first

Note: 1. When you need to read the meter address, just send this command; 2. Verification, here, the verification is before the verification byte (not included), after the 0x68 header (included), the arithmetic sum of all data is taken in the lower eight bits. When calibrating the meter, check the coefficients of 0.05, 0.25, and 2.5 points, and the coefficient of 0.75 point is determined by 2.5 and 0.25 points; when the three points of 0.05, 0.25, and 2.5 are verified, the meter is qualified.

2. Write table number and time:

Command:

FE FE FE FE FE FE 68 20 21 43 65 87 00 11 11①

39②

11 18

A0 AA③ 78 56 34 12 00 11 11④ 25 51 08 26 09 17 20⑤ C0 16

① Current table number. If the current table number is unknown, use the broadcast address

② Control code 0x39;

③ Data identifier: 0xA018, serial number: 0xAA

④ Write address. Note that the manufacturer code is fixed to 0x1111 (BCD code), and the highest two digits of the table number are fixed to 0x00 (BCD code).

Actually use 8 bits

⑤ Current time, at this position 08:51 on September 26, 2017 25 seconds

Remarks: Check, here, the check is before the check byte (not included), after the 0x68 header (inclusive), the arithmetic sum of all data is taken the lower eight bits

Reply:

FE FE FE FE FE 68 20 78 56 34 12 00 11 11 00 03 18 A0 00 79 16

0x79, check

Remarks: Here, the check is before the check byte (not included), after the 0x68 header (inclusive), the arithmetic sum of all data is taken the lower eight bits

Enable new address reply

3. Write caliber:

Command:

FE FE FE FE FE FE 68 20 78 56 34 12 00 11 11①

31②

06 A0

18 88③ 00 04 00④ 39 16

① Table number, if unknown, send broadcast address

② Control code: 0x31

③ Data identification: 0x18A0, serial number: 0x88

④ Caliber: 0x0004; see the caliber code above

Remarks: Check, here, the check is before the check byte (not included), after the 0x68 header (inclusive), the arithmetic sum of all data is taken as the lower

Eight bits

Reply:

FE FE FE FE FE 68 20 78 56 34 12 00 11 11 00 03 A0 18 00 79 16

0x79, check

Remarks: Check, here, the check is before the check byte (not included), after the 0x68 header (inclusive), the arithmetic sum of all data is taken as the lower

Eight bits

4. Accumulation clear:

Command:

FE FE FE FE FE FE 68 20 78 56 34 12 00 11 11 ① 04 ② 03 04

90 00 ③

59 16

① Table number, if unknown, send broadcast address

② Control code: 0x04

③ Data identifier: 0x9004, serial number: 0x00

Remarks: Check, here, the check is before the check byte (not included), after the 0x68 header (included), the arithmetic sum of all data is taken low

Eight bits

Reply:

FE FE FE FE FE 68 20 78 56 34 12 00 11 11 84 03 04 90 00 D9 16

5. Write flow coefficient:

Command:

FE FE FE FE FE FE 68 20 78 56 34 12 00 11 11 ①

36 ②

0C A0

19 88 ③ 00 (00 20) ④ (00 18) ⑤ (00 10) ⑥ (00 20) ⑦ A9 16

① Table number, if unknown, send broadcast address

② Control code: 0x36

③ Data identification: 0x19A0, serial number: 0x88

④ 2.5 flow points (HEX format)

⑤ 0.75 flow points (HEX format)

⑥ 0.25 flow points (HEX format)

⑦ 0.05 flow points (HEX format)

Note: Check, here, the check is before the check byte (not included), after the 0x68 header (included), the arithmetic sum of all data is taken low

Eight bits

Reply:

FE FE FE FE FE 68 20 78 56 34 12 00 11 11 00 03 A0 19 00 7A 16

6. Enter the test:

Command:

FE FE FE FE FE FE 68 20 78 56 34 12 00 11 11 ① 33 ② 00 F1 ③

16

① Table number, if unknown, send broadcast address

② Control code: 0x36

③ Verification, here, the verification is before the verification byte (not included), after the 0x68 packet header (included), the arithmetic sum of all data is taken from the lower eight

bits

Reply:

FE FE FE FE FE 68 20 78 56 34 12 00 11 11 00 03 2F 16

Note: This reply packet has no verification, only needs to determine whether it is complete and whether the table number corresponds;

7. Normal meter reading

Command:

FE FE FE FE FE FE 68 20 78 56 34 12 00 11 11①

01②

03 1F

90③ 00 71 16

① Table number, if unknown, send broadcast address

② Control code: 0x01

③ Data identifier: 0x901F

Reply:

FE FE FE FE FE FE 68 (20) (78 56 34 12 00 11 11) (81) (2E) (1F 90 12) (00 00

00 00 05)① (00 00 00 00 05)② (00 00 00 00 17)③ (00 00 00 00 35)④ (01 00 00 00

2C)⑤ (00 00 00)⑥ (00 00 00)⑦ (83 00 00)⑧ (38 05 00 08 11 17 20) ⑨ (00 0E) ⑩ CF

16

①Current cooling capacity

②Current heat capacity

③Heat power

④Instantaneous flow rate

⑤Cumulative flow rate

⑥Supply water temperature

⑦Return water temperature

⑧Cumulative working time

⑨Current instrument time

⑩Instrument status