**Heat meters MODBUS protocol**

Heat meters MODBUS provisions:
2400 baud rate, parity, 8 data bits, 1 stop bit.
The factory default is 01 modbus address.

### MODBUS register table

<table>
<thead>
<tr>
<th>Register Address</th>
<th>Register number</th>
<th>The corresponding value name</th>
<th>type of data</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001-0001</td>
<td>1</td>
<td>Instantaneous flow</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0002-0002</td>
<td>1</td>
<td>Set aside (not enabled)</td>
<td>INTEGER</td>
<td></td>
</tr>
<tr>
<td>0003-0003</td>
<td>1</td>
<td>Instantaneous flow unit</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0004-0005</td>
<td>2</td>
<td>power</td>
<td>LONG</td>
<td></td>
</tr>
<tr>
<td>0006-0006</td>
<td>1</td>
<td>Power Units</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0007-0008</td>
<td>2</td>
<td>Cumulative flow</td>
<td>LONG</td>
<td>*</td>
</tr>
<tr>
<td>0009-0009</td>
<td>1</td>
<td>Cumulative flow units</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0010-0011</td>
<td>2</td>
<td>Cumulative heat</td>
<td>LONG</td>
<td>*</td>
</tr>
<tr>
<td>0012-0012</td>
<td>1</td>
<td>The cumulative thermal units</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0013-0014</td>
<td>2</td>
<td>The cumulative amount of cold</td>
<td>LONG</td>
<td>*</td>
</tr>
<tr>
<td>0015-0015</td>
<td>1</td>
<td>Cumulative cold units</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0016-0017</td>
<td>2</td>
<td>Inlet temperature T1</td>
<td>LONG</td>
<td>x0.01 °C</td>
</tr>
<tr>
<td>0018-0019</td>
<td>2</td>
<td>Return water temperature T2</td>
<td>LONG</td>
<td>x0.01 °C</td>
</tr>
<tr>
<td>0020-0020</td>
<td>1</td>
<td>status</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0021-0022</td>
<td>2</td>
<td>operating hours</td>
<td>LONG</td>
<td>*</td>
</tr>
<tr>
<td>0023-0024</td>
<td>2</td>
<td>clock</td>
<td>BCD</td>
<td>MMSS - -HH</td>
</tr>
<tr>
<td>0025-0026</td>
<td>2</td>
<td>date</td>
<td>BCD</td>
<td>MMDD YYYY</td>
</tr>
<tr>
<td>0027-0027</td>
<td>1</td>
<td>4-20mA output current value</td>
<td>INTEGER</td>
<td>x0.01mA</td>
</tr>
<tr>
<td>0028-0029</td>
<td>2</td>
<td>4mA base value</td>
<td>LONG</td>
<td>*</td>
</tr>
<tr>
<td>0030-0031</td>
<td>2</td>
<td>20mA base value</td>
<td>LONG</td>
<td>*</td>
</tr>
<tr>
<td>0032-0032</td>
<td>1</td>
<td>caliber</td>
<td>INTEGER</td>
<td>Example 0x0100: diameter of DN100</td>
</tr>
<tr>
<td>0033-0034</td>
<td>2</td>
<td>Table No.</td>
<td>BCD</td>
<td>No. 8 188 Low</td>
</tr>
<tr>
<td>0035-0035</td>
<td>1</td>
<td>MODBUS address</td>
<td>INTEGER</td>
<td>*</td>
</tr>
<tr>
<td>0036-0036</td>
<td>1</td>
<td>Table Type</td>
<td>INTEGER</td>
<td>0: meter 1: Hot Table</td>
</tr>
</tbody>
</table>
**Unit Analysis:**

Accumulated flow:

- 0C 14 units 10L
- 0C 15 units 100L
- 0C 16 units of 1 m3

Instantaneous flow:

- 0B 3B unit 1L/h
- 0B 3C units 10L/h
- 0B 3D units of 100L/h

Power unit:

- 0B 2C unit is 10W
- 0B 2D unit is 100W
- 0B 2E unit is KW

Thermal units:

- 0C 06 units KWh
- 0C 0E units 1MJ
- 0C 0F unit is 10MJ
- 0C 10 units 1GJ

Temperature:

- Inlet temperature unit is 0.01 °C
- Return temperature unit is 0.01 °C

For example: the cumulative flow: register 7 is: 0XE240

- Value register 8: 0X0001
- Register 9 is: 0X0C14
Resolves to: register value lower cumulative flow 7 16-bit value, the value of the accumulated flow register 8

The high 16-bit values, integrated flow rate value and the register 8 and the value register 7, so that the cumulative

Flow $0X0001E240$ (HEX) = 123456 (decimal), i.e. $0XC14$ unit 10L, so tired

Excluding traffic is $123456 \times 10L = 1234560L = 1234.56$ m$^3$
Instantaneous flow: register value 1: 0X0CB2

Register value 3: 0X0B3B

Resolves to: instantaneous flow 0X0CB2 (HEX) = 3250 (decimal), i.e. 0X0B3B units 1L / h, the
Instantaneous flow rate of 3250 * 1L / h = 3250L / h = 3.250 m³ / h

Power and thermal analysis method above.

*Data Format:

32-bit data type LONG, INTEGER data type is 16 bits. Thus, two registers are used to keep the
Storing a data type LONG. A first register (lower address), lower than the 16-bit data storage. the second
Register (high address), higher than the 16-bit data storage. Is a hexadecimal number.

Set MODBUS address:

68 20 00 00 00 00 00 00 00 00 15 0a a0 18 00 01 00 00 00 00 00 00 60 16
00 is the factory default address; 02 is the new modbus address; 60 for the checksum.

Successfully set back several formats: 68 20 02 00 00 00 00 00 00 95 03 a0 18 00 DA 16
Note: MODBUS address table using the lowest bit number 188, write command MODBUS protocol is compatible with
the 188.

For example: read modbus address to the watch 02:

Send: 02 03 00 01 00 26 95 E3

modbus address  Control word 1 start register 38 is the end of the CRC register low byte high byte CRC check

Reception: 02 03 4C 00 00 00 00 0B 3D 00 00 00

modbus address control data word length of instantaneous flow reserve (unused) instantaneous unit  Power (low)
power (high)

0B 2E 00 A6 00 00 0C 16 F8 55 00 06 0C 06

Power units total flow (low) Accumulated flow (high) Cumulative total flow per unit of heat (low) Cumulative calories
(high) thermal units

30 39 00 00 0C 06 07 FB 00 00 08 17 00 00

Cumulative cold (low) amount of accumulated cold (high) refrigeration unit Water temperature (low) water temperature
(higher) return water temperature (low) return water temperature (higher)

00 0,400,000,000,000,000 0,000,000,000,000,000 0,000,000,000,000,000 0,000,000,000,000,000

Table state

Not yet enabled

00 11 11 11 11 00 02 00 01 00 01 00 00 0B B0

No. MODBUS address low byte CRC check CRC check high byte

Analysis: calories: 0X0006F855 (HEX) = 456789, the unit KWh, so the heat is
456789KWh, Similarly, the cooling capacity of 12345 KWh, 0KW power, instantaneous 0.0 m3 / h,
Total flow 166 m35.

Read registers that can be selected according to: heat Table 1-20 General register read it.
Status bit

Status bit have the following meanings: Status 2 bytes, high byte reserved unused, from low to high low byte
Bits represented sequentially as meaning: short circuit, anhydrous, bad circuit board, through flow, low voltage, high
2
Bits are unused. When a status bit 00 indicates normal operation. Bit to 0 indicates that the status is normal, for example:
Status bit is 0X0026, showing: Low + + disconnection anhydrous
Status bit interpretation: water meter or a thermal short-circuiting means inside the table temperature probe short
circuit, heat meter by meter means
Inside breaking temperature probe, there are no pipe anhydrous represents water or water pipe is not full, a circuit board
bad abnormality,
Overcurrent table showing the water flow rate exceeds the measurement range, low-voltage indicates that the battery
voltage is low.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01- 02- short circuit breaker</td>
<td>04- 08- anhydrous bad</td>
<td>20 low voltage overcurrent 10-</td>
</tr>
<tr>
<td>00-</td>
<td>normal</td>
<td>operation</td>
</tr>
<tr>
<td>High Byte</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>byte</td>
</tr>
</tbody>
</table>

00,111,111
Low pressure overcurrent Bad Anhydrous Open circuit
Short circuit
(0: 1 does not appear the following phenomena: that following phenomena occur)

**Note:** For example: 26 (H)

00,100,110
Low-voltage circuit breaker anhydrous

Note:
Meter only: instantaneous, cumulative flow, temperatures T1, no heat, refrigeration, power, T2.