

# Heat meter communication protocol

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Modbus

2016

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# 1 Date type

Date type	Date size (Bit)	Register number
Bool	1	1
Int	16	1
Float	32	2

# 2 Date-Register map table

Register	Date type	Function Code	information analysis	Read-Write
0x0200	Int	0x03	Positive flow volume(Unit:L) high-32bit—high-16bit	Only read
0x0201	Int	0x03	Positive flow volume(Unit:L) high-32bit—low-16bit	Only read
0x0202	Int	0x03	Positive flow volume(Unit:L) low-32bit—high-16bit	Only read
0x0203	Int	0x03	Positive flow volume(Unit:L) low-32bit—low-16bit	Only read
0x0204	Int	0x03	Heat quantity (Unit:Wh) high-32bit—high-16bit	Only read
0x0205	Int	0x03	Heat quantity (Unit:Wh) high-32bit—low-16bit	Only read
0x0206	Int	0x03	Heat quantity (Unit:Wh) low-32bit—high-16bit	Only read
0x0207	Int	0x03	Heat quantity (Unit:Wh) low-32bit—low-16bit	Only read
0x0208	Int	0x03	Monthly heat quantity (Unit:Wh) high-32bit—high-16bit	Only read
0x0209	Int	0x03	Monthly heat quantity (Unit:Wh) high-32bit—low-16bit	Only read
0x020A	Int	0x03	Monthly heat quantity (Unit:Wh) low-32bit—high-16bit	Only read
0x020B	Int	0x03	Monthly heat quantity (Unit:Wh) low-32bit—low-16bit	Only read
0x020C			Reserved	
0x020D			Reserved	
0x020E			Reserved	
0x020F			Reserved	
0x0210			Reserved	
0x0211			Reserved	
0x0212	Int	0x03	Cool quantity (Unit:Wh) high-32bit—high-16bit	Only read
0x0213	Int	0x03	Cool quantity (Unit:Wh) high-32bit—low-16bit	Only read
0x0214	Int	0x03	Cool quantity (Unit:Wh) low-32bit—high-16bit	Only read
0x0215	Int	0x03	Cool quantity (Unit:Wh) low-32bit—low-16bit	Only read
0x0216	Int	0x03	Monthly cool quantity (Unit:Wh) high-32bit—high-16bit	Only read
0x0217	Int	0x03	Monthly cool quantity (Unit:Wh) high-32bit—low-16bit	Only read
0x0218	Int	0x03	Monthly cool quantity (Unit:Wh) low-32bit—high-16bit	Only read
0x0219	Int	0x03	Monthly cool quantity (Unit:Wh) low-32bit—low-16bit	Only read
0x0400	Float	0x03	Flow rate(Unit:m <sup>3</sup> /h)	Only read
0x0402	Float	0x03	Flow temperature(Unit:°C)	Only read
0x0404	Float	0x03	Return temperature(Unit:°C)	Only read
0x0406	Float	0x03	Temperature difference (Unit:°C)	Only read
0x0408	Float	0x03	Heat power(Unit:KW)	Only read
0x0500	Int	0x03	Operating time(Unit:h)	Only read

0x0503	Int	0x03	Error code	Only read
0x0607	Int	0x03/0x10/0x06	Address	Read and write
0x0608	Int	0x03/0x10/0x06	Communication parameters	Read and write
0xFEFF	Char	0x10	Setting the date and time(Y.M.D.H.m.s) e.g.02-10-2009 14:15:16 01 10 fe ff 00 01 0C 30 32 31 30 30 39 31 34 31 35 31 36 35 49	Only write

## 3 Request master and response slave

### 3.1 Read positive flow volume

Request master:

0x01	0x03	0x02	0x00	0x00	0x04	0x45	0xB1
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0200, #Points:0x0004

CRC16: 0x45 0xB1

Response slave:

0x01	0x03	0x08	0x01	0x23	0x45	0x67	0x89	0x01	0x23	0x45	0xDE	0xDB
------	------	------	------	------	------	------	------	------	------	------	------	------

Date length: 0x08

Date: 0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45, mean 0X123456789012345 = 81985529205302085

Positive flow volume is 81985529205302085L

### 3.2 Read heat quantity

Request master:

0x01	0x03	0x02	0x04	0x00	0x04	0x04	0x70
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0204, #Points:0x0004

CRC16: 0x04 0x70

Response slave:

0x01	0x03	0x08	0x01	0x23	0x45	0x67	0x89	0x01	0x23	0x45	0xDE	0xDB
------	------	------	------	------	------	------	------	------	------	------	------	------

Date length: 0x08

Date: 0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45, mean 0X123456789012345 = 81985529205302085

Heat quantity is 81985529205302085Wh

### 3.3 Read monthly heat quantity

Request master:

0x01	0x03	0x02	0x08	0x00	0x04	0xC4	0x73
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0208, #Points:0x0004

CRC16: 0xC4 0x73

Response slave:

0x01	0x03	0x08	0x01	0x23	0x45	0x67	0x89	0x01	0x23	0x45	0xDE	0xDB
------	------	------	------	------	------	------	------	------	------	------	------	------

Date length: 0x08

Date: 0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45, mean 0X123456789012345 = 81985529205302085

Monthly heat quantity is 81985529205302085Wh

### 3.4 Read cool quantity

Request master:

0x01	0x03	0x02	0x12	0x00	0x04	0xE5	0xB4
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0212, #Points:0x0004

CRC16: 0xE5 0xB4

Response slave:

0x01	0x03	0x08	0x01	0x23	0x45	0x67	0x89	0x01	0x23	0x45	0xDE	0xDB
------	------	------	------	------	------	------	------	------	------	------	------	------

Date length: 0x08

Date: 0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45, mean 0X123456789012345 = 81985529205302085

Cool quantity is 81985529205302085Wh

### 3.5 Read monthly cool quantity

Request master:

0x01	0x03	0x02	0x16	0x00	0x04	0xA4	0x75
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0216, #Points:0x0004

CRC16: 0xA4 0x75

Response slave:

0x01	0x03	0x08	0x01	0x23	0x45	0x67	0x89	0x01	0x23	0x45	0xDE	0xDB
------	------	------	------	------	------	------	------	------	------	------	------	------

Date length: 0x08

Date: 0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45, mean 0X123456789012345 = 81985529205302085

Monthly cool quantity is 81985529205302085Wh

## 3.6 Read flow rate

Request master:

0x01	0x03	0x04	0x00	0x00	0x02	0xC5	0x3B
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0400, #Points:0x0002

CRC16: 0xC5 0x3B

Response slave:

0x01	0x03	0x04	0x42	0x11	0x47	0xAE	0x0C	0x02
------	------	------	------	------	------	------	------	------

Date length: 0x04

Date: 0x42 0x11 0x47 0xAE, mean 0X421147AE = 36.32

Flow rate is 36.32m<sup>3</sup> /h

## 3.7 Read flow temperature

Request master:

0x01	0x03	0x04	0x02	0x00	0x02	0x64	0xFB
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0402, #Points:0x0002

CRC16: 0x64 0xFB

Response slave:

0x01	0x03	0x04	0x41	0xD5	0x70	0xA3	0x9A	0x4E
------	------	------	------	------	------	------	------	------

Date length: 0x04

Date length: 0x41 0xD5 0x70 0xA3, mean 0x41D570A3 = 26.68

Flow temperature if 26.68°C

## 3.8 Read return temperature

Request master:

0x01	0x03	0x04	0x04	0x00	0x02	0x84	0xFA
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0404, #Points:0x0002

CRC16: 0x84 0xFA

Response slave:

0x01	0x03	0x04	0x41	0xE0	0x14	0x7A	0x61	0x1A
------	------	------	------	------	------	------	------	------

Date length: 0x04

Date: 0x41 0xE0 0x14 0x7A, mean 0x41E0147A = 28.01

Return temperature is 28.01°C

## 3.9 Read temperature difference

Request master:

0x01	0x03	0x04	0x06	0x00	0x02	0x25	0x3A
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0406, #Points:0x0002

CRC16: 0x25 0x3A

Response slave:

0x01	0x03	0x04	0xBF	0xAC	0xCC	0xCC	0x4A	0x93
------	------	------	------	------	------	------	------	------

Date length: 0x04

Date: 0xBF 0xAC 0xCC 0xCC, mean 0xBFACCCCC = -1.35

Temperature difference is -1.35°C

## 3.10 Read heat power

Request master:

0x01	0x03	0x04	0x08	0x00	0x02	0x44	0xF9
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0408, #Points:0x0002

CRC16: 0x44 0xF9

Response slave:

0x01	0x03	0x04	0x42	0x11	0x47	0xAE	0x0C	0x02
------	------	------	------	------	------	------	------	------

Date length: 0x04

Date: 0x42 0x11 0x47 0xAE, mean 0x421147AE = 36.32

Secondary address is 36.32KW

## 3.11 Read operating time

Request master:

0x01	0x03	0x05	0x00	0x00	0x02	0x84	0xC6
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0500, #Points:0x0002

CRC16: 0x84 0xC6

Response slave:

0x01	0x03	0x02	0x12	0x34	0xB5	0x33
------	------	------	------	------	------	------

Date length: 0x02

Date: 0x12 0x34, mean 0x1234

Operating time is 4660h.

## 3.12 Read error code

Request master:

0x01	0x03	0x05	0x03	0x00	0x01	0x74	0xC6
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0503, #Points:0x0001

CRC16: 0x74 0xC6

Response slave:

0x01	0x03	0x02	0x00	0x02	0x39	0x85
------	------	------	------	------	------	------

Date length: 0x02

Date: 0x00 0x02, mean 0x0002

Error code is 0x0002(acc. to table 3.12.1)

Table 3.12.1 Error code

	BIT15~BIT4	BIT3	BIT2	BIT1	BIT0
0	Reserved	Not power low	No return temperature sensor error	No flow temperature sensor error	Reserved
1		Power low	return temperature sensor error	flow temperature sensor error	

## 3.13 Read address

Request master:

0x01	0x03	0x06	0x07	0x00	0x01	0x35	0x43
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0607, #Points:0x0001

CRC16: 0x35 0x43

Response slave:

0x01	0x03	0x02	0x00	0x01	0x79	0x84
------	------	------	------	------	------	------

Date length: 0x02

Date: 0x00 0x01, mean 0x0001

Address is 1

## 3.14 Setting address

### 3.14.1 Function Code 16

Request master:

0x01	0x10	0x06	0x07	0x00	0x01	0x02	0x00	0x02	0x40	0x26
------	------	------	------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x10

Register: 0x0607, #Points: 0x0001

Bytes number: 0x02



Setting address: 0x0002

CRC16: 0x40 0x26

Response slave:

0x01	0x10	0x06	0x07	0x00	0x01	0xB0	0x80
------	------	------	------	------	------	------	------

Address of before setting: 0x01

Function Code: 0x10

Register: 0x0607

Date length: 0x0001

CRC16: 0xB0 0x80

### 3.14.2 Function Code 6

Request master:

0x01	0x06	0x06	0x07	0x00	0x02	0xB9	0x42
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x06

Register: 0x0607

Setting address: 0x0002

CRC16: 0xB9 0x42

Response slave:

0x01	0x06	0x06	0x07	0x00	0x02	0xB9	0x42
------	------	------	------	------	------	------	------

Address of before setting: 0x01

Function Code: 0x06

Register: 0x0607

Setting address: 0x0002

CRC16: 0xB9 0x42

## 3.15 Read communication parameters

Request master:

0x01	0x03	0x06	0x08	0x00	0x01	0x05	0x40
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x03

Register: 0x0608, #Points:0x0001

CRC16: 0x05 0x40

Response slave:

0x01	0x03	0x02	0x00	0x24	0xB8	0x5F
------	------	------	------	------	------	------

Date length: 0x02

Date: 0x00 0x24, mean 0x0024

Communication parameters is 0x0024(acc. to table 3.15.1)

Table 3.15.1 Communication parameters

	BIT15~BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
--	------------	------	------	------	------	------	------

0	Reserved	00b: even parity	0000b: 2400bps
1		01b: none parity	0001b: 300bps
		10b: even parity	0010b: 600bps
		11b: odd parity	0011b: 1200bps
			0100b: 2400bps
			0101b: 4800bps
			0110b: 9600bps
			0111b: 2400bps

## 3.16 Setting communication parameters

### 3.16.1 Function Code 16

Request master:

0x01	0x10	0x06	0x08	0x00	0x01	0x02	0x00	0x35	0x01	0x0F
------	------	------	------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x10

Register: 0x0608, #Points: 0x0001

Bytes number: 0x02

Setting communication parameters: 0x0035(acc. to table 3.15.1)

CRC16: 0x01 0x0F

Response slave:

0x01	0x10	0x06	0x08	0x00	0x01	0x80	0x83
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x10

Register: 0x0608

Date length: 0x0001

CRC16: 0x80 0x83

### 3.16.2 Function Code6

Request master:

0x01	0x06	0x06	0x08	0x00	0x24	0x08	0x9B
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x06

Register: 0x0608

Setting communication parameters: 0x0024(acc. to table 3.15.1)

CRC16: 0x08 0x9B

Response slave:

0x01	0x06	0x06	0x08	0x00	0x24	0x08	0x9B
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x06

Register: 0x0608

Setting communication parameters: 0x0024(acc. to table 3.15.1)

CRC16: 0x08 0x9B

## 3.17 Setting the date and time

Request master:

0x01	0x10	0xFE	0xFF	0x00	0x01	0x0C	0x31	0x32	0x30	0x35	0x31	0x35	0x31	0x36
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

0x33	0x31	0x31	0x36	0xAF	0x96
------	------	------	------	------	------

Address: 0x01

Function Code: 0x10

Register: 0xFEFF, #Points: 0x0001

Bytes number: 0x0C

Setting the date and time: 0x31 0x32 (12 month), 0x30 0x35 (05day), 0x31 0x35 (15year), 0x31 0x36 (16hour), 0x33 0x31 (31 minute), 0x31 0x36 (16 second)

CRC16: 0xAF 0x96

Response slave:

0x01	0x10	0xFE	0xFF	0x00	0x01	0x00	0x11
------	------	------	------	------	------	------	------

Address: 0x01

Function Code: 0x10

Register: 0xFEFF

Date length: 0x0001

CRC16: 0x00 0x11

## 3.16 Response error code analysis

Response slave mode

0x01	0x80	0x01	0x80	0x00
------	------	------	------	------

Address: 0x01

Error code: 0x8001

CRC16: 0x80 0x00

Error code

Error code	analysis
0x8001	Setting date error
0x8002	Address error
0x8003	The sum of address and #Points is error(too long or zero)
0x8030	Address it too long than 0XF7 (247)