AB Axis Industries

Heat meter Qalcosonic HEAT 2
M-bus communication protocol description

2013

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1. Reading of integral and moment parameters

First is SND_NKE / E5 negotiation is performed. Master sends to the meter:

0	1	2	3	4
10h	40h	A	CS	16h

Answer of the meter:

0
E5h

A – M-bus primary address
CS – control sum

Then the selection of integral and moment parameters is performed. Master sends to the meter:

0	1	2	3	4	5	6	7	8	9
68h	04h	04h	68h	53h	A	50h	00h	CS	16h

Answer of the meter:

0
E5h

Then the query for data is performed. Master sends to the meter:

0	1	2	3	4
10h	5B/7B	A	CS	16

Answer of the meter:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
68h	L	L	68h	08h	A	72h	Nr_0	Nr_1	Nr_2	Nr_3	34h	2Ch	05h	04h

15	16	17	18	19-(n-2)	n-1	n
Acc	00h	00h	00h	Integral and moment parameters block	CS	16h

7...10 bytes: „Nr_0... Nr_3“ – Serial number of meter,
11, 12 bytes: „34h,2Ch“ – Manufacturer code (AXI)
13 byte: „05h“ – Number of M-bus protocol version (3)
14 byte: „04h“ – Measured medium („Heat“)

In the block of integral moment parameters can be following parameters (depending on configuration of the meter):

1. **Energy (total)** (except scheme F1 and F2).
2. **Energy 1** (only for schemes U1L, U2L, A, AC, A1, A1C, A2, A4, U1A3 and U2A3).
3. **Energy 2** (only for schemes U1L, U2L, A, AC, A1, A1C, A2, A4, U1A3 and U2A3).
4. **Volume (or mass) 1**.
5. **Volume (or mass) 2** (only for schemes U1F, U2F, A, AC, A1, A1C, A2, A4, A5, U1A3, U2A3 and F2).

6. **Volume (or mass) -2** (only for schemes A, AC, A1, A1C, when algorythm 3 is selected).
7. **Volume (or mass) 3** (when flow input 3 is active).
8. **Volume (or mass) 4** (when flow input 4 is active).
9. **Power** (except schemes F1 and F2).
10. **Flow 1**
11. **Flow 2** (only for schemes U1F, U2F, A, AC, A1, A1C, A2, A4, A5, U1A3, U2A3 and F2).
12. **Flow 3** (when flow input 3 is active).
13. **Flow 4** (when flow input 4 is active).
14. **Temperature 1** (when temperature input 1 is active).
15. **Temperature 2** (when temperature input 2 is active).
16. **Temperature 3** (when temperature input 3 is active).
17. **Temperature 4 (cold water temperature)** (only for schemes AC, A1C, A3, U1A3, U2A3).
18. **Pressure 1** (when pressure input 1 is active).
19. **Pressure 2** (when pressure input 2 is active).

Also, independently of configuration, following parameters are in the block:

1. **Current date/time** of the meter
2. **Error codes**
3. **Power supply duration**
4. **Normal working time**
5. **Additional control sum** (CRC-16)

Coding of parameters

Energy

Parameter	DIF	VIF								Data
		0,1 MWh	0,1 GJ	0,01 MWh	0,01 GJ	0,001 MWh	0,001 GJ	0,0001 MWh	0,0001 GJ	
Energy (total)	04	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
Energy 1	84 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
Energy 2	84 80 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)

Volume (or mass)

Parameter	DIF	VIF								Data
		1 m^3	1 t	0,1 m^3	0,1 t	0,01 m^3	0,01 t	0,001 m^3	0,001 t	
Volume (mass) 1	04	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) 2	84 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) 3	84 80 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) 4	84 C0 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) -2	84 80 80 40	16	96	15	95	14	94	13	93	4 bytes (long)

Power

Parameter	DIF	VIF	Data
Power	05	2E	4 bytes (float) kW

Flow

Parameter	DIF	VIF (m^3/h)	VIF (t/h)	Data
Flow 1	05	3E	3E	4 bytes (float)
Flow 2	85 40	3E	3E	4 bytes (float)
Flow 3	85 80 40	3E	3E	4 bytes (float)
Flow 4	85 C0 40	3E	3E	4 bytes (float)

Temperature

Parametras	DIF	VIF	Data
Temperature 1	02	59	2 bytes (word), 0,01ºC
Temperature 2	02	5D	2 bytes (word), 0,01ºC
Temperature 3	82 40	59	2 bytes (word), 0,01ºC
Temperature 4 (const.)	82 40	65	2 bytes (word), 0,01ºC

Pressure

Parametras	DIF	VIF	Data
Pressure 1	03	68	3 bytes (word) 0,1 kPa
Pressure 2	83 40	68	3 bytes (word) 0,1 kPa

Current date/time

Parameter	DIF	VIF	Data
Date/time	44	6D	4 bytes (date/time format)

Format of date/time is following:

Bytes																													
3								2								1								0					
Bits																													
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
$Year_1$				Month				$Year_0$			Day					0	0	0	Hour					0	0	Minutes					

Minutes - <0 to 59>
Hour - <0 to 23>
Day - <1 to 31>
Month - <1 to 12>
Year=$Year_1$|$Year_0$ ($Year_0$ – low significant part, $Year_1$ – high significant part) <0 to 99>

Error codes

Parameter	DIF	VIF	Er1 (2 bytes)		Er2 (4 bytes)			
Error code	06	FD 17	B1	B2	B3	B4	B5	B6

Format of error code **Er1** (**Er1: FEDCBA**) is following:

Byte B2								Byte B1							
Bits															
07	06	05	04	03	02	01	00	07	06	05	04	03	02	01	00
Digits and bits (3 2 1 0) of error code															
F	E			D			C			B			A		
0	3	2	1	3	2	1	2	1	0	2	1	0	2	1	0

Format of error code **Er2** (**Er2: EDCBA**) is following:

Byte B4								Byte B3							
Bits															
07	06	05	04	03	02	01	00	07	06	05	04	03	02	01	00
Digits of error code															
D				C				B				A			

Byte B6								Byte B5							
Bits															
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Digits of error code															
Not used												E			

Power supply duration

Parameter	DIF	VIF	Data
Power supply duration	04	20	4 bytes (long integer, time in seconds)

Normal working time

Parameter	DIF	VIF	Data
Normal working time	04	24	4 bytes (long integer, time in seconds)

Additional control sum (CRC-16)

Parameter	DIF	VIF	Data
Additional control sum (CRC-16)	02	7F	2 bytes

2. Readout of hours and days archive

First is SND_NKE / E5 negotiation is performed. Master sends to the meter:

0	1	2	3	4
10h	40h	A	CS	16h

Answer of the meter:

0
E5h

Selection of hours or days archive is performed. Master sends to the meter:

0	1	2	3	4	5	6	7	8	9
68h	04h	04h	68h	53h	A	50h	04h – for hours archive 03h – for days archive	CS	16h

Answer of the meter:

0
E5h

Then the query for data is performed. Master sends to the meter:

0	1	2	3	4
10h	5B/7B	A	CS	16

Answer of the meter:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
68h	L	L	68h	08h	A	72h	Nr_0	Nr_1	Nr_2	Nr_3	34h	2Ch	05h	04h

15	16	17	18	19-(n-2)	n-1	n
Acc	00h	00h	00h	Hours/days archive record block	CS	16h

The readout of the next record of the archive is performed by sending data query packet with changed 1st byte 5Bh/7Bh (toggling the most significant bit of the byte). Archive readout is performed from the newest records.
In the first block of hours and days archive can be following parameters (depending on meter configuration):

1. **Energy (total)** (except scheme F1 and F2).
2. **Energy 1** (only for schemes U1L, U2L, A, AC, A1, A1C, A2, A4, U1A3 and U2A3).
3. **Energy 2** (only for schemes U1L, U2L, A, AC, A1, A1C, A2, A4, U1A3 and U2A3).
4. **Volume (or mass) 1**.
5. **Volume (or mass) 2** (only for schemes U1F, U2F, A, AC, A1, A1C, A2, A4, A5, U1A3, U2A3 and F2).
6. **Volume (or mass) -2** (only for schemes A, AC, A1, A1C, when algorythm 3 is selected).
7. **Volume (or mass) 3** (when flow input 3 is active).
8. **Volume (or mass) 4** (when flow input 4 is active).
9. **Power** (except schemes F1 and F2).
10. **Temperature 1 (average)** (when temperature input 1 is active).
11. **Temperature 2 (average)** (when temperature input 2 is active).
12. **Temperature 3 (average)** (when temperature input 3 is active).
13. **Temperature 4 (average of cold water temperature)** (only for schemes AC, A1C, A3, U1A3, U2A3).

14. **Pressure 1 (average)** (when pressure input 1 is active).
15. **Pressure 2 (average)** (when pressure input 2 is active).

Also, independently of configuration, following parameters are in the block:

1. **Current date/time** of the meter
2. **Error codes**
3. **Power supply duration**
4. **Normal working time**
5. **Additional control sum** (CRC-16)

In second block can be following parameters (depending on meter configuration):

1. **Duration, when temperature difference (T1-T2) < (T1-T2)min.**
2. **Duration, when flow q1 < q1min.**
3. **Duration, when flow q2 < q2min.**
4. **Duration, when flow q3 < q3min.**
5. **Duration, when flow q4 < q4min.**
6. **Duration, when flow q1 > q1max.**
7. **Duration, when flow q2 > q2max.**
8. **Duration, when flow q3 > q3max.**
9. **Duration, when flow q4 > q4max.**
10. **Duration of error of flow sensor 1**
11. **Duration of error of flow sensor 2**
12. **Duration of error of flow sensor 3**
13. **Duration of error of flow sensor 4**
14. **Additional control sum** (CRC-16)

Coding of parameters

Energy

Parameter	DIF	VIF								Data
		0,1 MWh	0,1 GJ	0,01 MWh	0,01 GJ	0,001 MWh	0,001 GJ	0,0001 MWh	0,0001 GJ	
Energy (total)	04	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
Energy 1	84 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
Energy 2	84 80 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)

Volume (or mass)

Parameter	DIF	VIF								Data
		1 m^3	1 t	0,1 m^3	0,1 t	0,01 m^3	0,01 t	0,001 m^3	0,001 t	
Volume (mass) 1	04	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) 2	84 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) 3	84 80 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) 4	84 C0 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) -2	84 80 80 40	16	96	15	95	14	94	13	93	4 bytes (long)

Temperature (average)

Parametras	DIF	VIF	Data
Temperature 1	02	59	2 bytes (word), 0,01ºC
Temperature 2	02	5D	2 bytes (word), 0,01ºC
Temperature 3	82 40	59	2 bytes (word), 0,01ºC
Temperature 4 (const.)	82 40	65	2 bytes (word), 0,01ºC

Pressure (average)

Parametras	DIF	VIF	Data
Pressure 1	03	68	3 bytes (word) 0,1 kPa
Pressure 2	83 40	68	3 bytes (word) 0,1 kPa

Date and time of records

Parameter	DIF	VIF	Data
Date/time	44	6D	4 bytes (date/time format)

Format of date/time is following:

Bytes																													
3				2				1				0																	
Bits																													
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
$Year_1$				Month				$Year_0$			Day					0	0	0	Hour					0	0	Minutes					

Minutes - <0 to 59>
Hour - <0 to 23>
Day - <1 to 31>
Month - <1 to 12>
Year=$Year_1$|$Year_0$ ($Year_0$ – low significant part, $Year_1$ – high significant part) <0 to 99>

Error codes

Parameter	**DIF**	**VIF**	**Er1 (2 bytes)**		**Er2 (4 bytes)**			
Error code	06	FD 17	B1	B2	B3	B4	B5	B6

Format of error code **Er1** (**Er1: FEDCBA**) is following:

Byte B2								Byte B1							
Bits															
07	06	05	04	03	02	01	00	07	06	05	04	03	02	01	00
Digits and bits (3 2 1 0) of error code															
F	E			D			C			B			A		
0	3	2	1	3	2	1	2	1	0	2	1	0	2	1	0

Format of error code **Er2** (**Er2: EDCBA**) is following:

Byte B4								Byte B3							
Bits															
07	06	05	04	03	02	01	00	07	06	05	04	03	02	01	00
Digits of error code															
D				C				B				A			

Byte B6								Byte B5							
Bits															
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Digits of error code															
Not used												E			

Power supply duration

Parameter	DIF	VIF	Data
Power supply duration	04	20	4 bytes (long integer, time in seconds)

Normal working time

Parameter	DIF	VIF	Data
Normal working time	04	24	4 bytes (long integer, time in seconds)

Additional control sum (CRC-16)

Parameter	DIF	VIF	Data
Additional control sum (CRC-16)	02	7F	2 bytes

Duration of errors

Parameter	DIF	VIF	Data
Duration, when temperature difference (T1-T2) < (T1-T2)min	04	74	4 bytes (long integer, time in seconds)
Duration, when flow q1 < q1min	84 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q2 < q2min	84 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q3 < q3min	84 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q4 < q4min	84 80 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q1 > q1max	84 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q2 > q2max	84 80 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q3 > q3max	84 C0 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q4 > q4max	84 80 80 80 40	74	4 bytes (long integer, time in seconds)
Duration of error of flow sensor 1	84 C0 80 80 40	74	4 bytes (long integer, time in seconds)
Duration of error of flow sensor 2	84 80 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration of error of flow sensor 3	84 C0 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration of error of flow sensor 4	84 80 80 C0 40	74	4 bytes (long integer, time in seconds)

3. Secondary addressing

Meter supports secondary addressing. The address of secondary addressing is meter parameter "Serial number" (Nr), and most significant digit (7-th) of address splits meter in to 1 … 7 sub-meters.
Possible meter response telegrams, depending on the address code, secondary address type meter configuration code bits (B0. .. B7) and meter configuration, see on the table:

Adress	Transmitted data	Conditions
{Nr}	As primary addressing case (see chapter 1)	B0=1 (or all B0,B1…B7=0) (standard settings)
{1000000+Nr}	Transmitted parameters E_1, V_2(or M_2), q_2, T_3, p_2, ton, td, coded as E, V(or M), q, T_1, p, ton, td	B1=1 and 2nd flow channel is on
{2000000+Nr}	Transmitted parameters E_2, V_3, q_3, ton, coded as E, V, q, ton	B2=1 and 3d flow channel is on
{3000000+Nr}	Transmitted parameters V_4, q_4 , ton, coded as V, q, ton	B3=1 and 4th flow channel is on
{4000000+Nr}	Days archive	B4=1
{5000000+Nr}	Hours archive	B5=1
{6000000+Nr}	Days archive from end of last month	B6=1
{7000000+Nr}	Hours archive from end of last month	B7=1

Here: E – energy
V – volume (M – mass)
q – flow
T – temperature
p – pressure
ton – power supply duration
td– normal working time
1…4 – number of channel

4. **Reading the relay output parameters**

First is SND_NKE / E5 negotiation is performed. Master sends to the meter:

0	1	2	3	4
10h	40h	A	CS	16h

Answer of the meter:

0
E5h

Selection of relay output parameters is performed. Master sends to the meter:

0	1	2	3	4	5	6	7	8	9
68h	04h	04h	68h	53h	A	50h	05h	CS	16h

Answer of the meter:

0
E5h

Then the query for data is performed. Master sends to the meter:

0	1	2	3	4
10h	5B/7B	A	CS	16

Answer of the meter:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
68h	21h	21h	68h	08h	A	72h	Nr_0	Nr_1	Nr_2	Nr_3	34h	2Ch	04h	04h

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Acc	00h	00h	00h	0Fh	00h	RelP	00h	Max_0	Max_1	Max_2	Max_3	Min_0	Min_1	Min_2	Min_3

31	32	33	34	35	36	37	38
$RegT_0$	$RegT_1$	$RegL_0$	$RegL_1$	$RegCS_0$	$RegCS_1$	CS	16

Parameters:

Parameter	Description
RelP	Code of parameter for relay output
Max	Upper value limit of regulated parameter (float)
Min	Lower value limit of regulated parameter (float)
RegT	Integral constant for regulation time (integer, sec)
RegL	Regulated valve run time (integer, sec)
Reg CS	Control sum of parameters RelP...RegL

5. **Setting the relay output parameters**

Master sends following packet to the meter:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
68h	15h	15h	68h	53h	A	51h	0Fh	00h	RelP	00h	Max_0	Max_1	Max_2	Max_3

15	16	17	18	19	20	21	22	23	24	25	26
Min_0	Min_1	Min_2	Min_3	$RegT_0$	$RegT_1$	$RegL_0$	$RegL_1$	$RegCS_0$	$RegCS_1$	CS	16

Answer of the meter:

0
E5h

Parameters:

Parameter	Description
RelP	Code of parameter for relay output
Max	Upper value limit of regulated parameter (float)
Min	Lower value limit of regulated parameter (float)
RegT	Integral constant for regulation time (integer, sec)
RegL	Regulated valve run time (integer, sec)
Reg CS	Control sum of parameters RelP...RegL

6. Reading of meter configuration

First is SND_NKE / E5 negotiation is performed. Master sends to the meter:

0	1	2	3	4
10h	40h	A	CS	16h

Answer of the meter:

0
E5h

Then the selection of configuration parameters is performed. Master sends to the meter:

0	1	2	3	4	5	6	7	n-1	n
68h	04h	04h	68h	53h	A	50h	06h	CS	16h

Answer of the meter:

0
E5h

Then the query for data is performed. Master sends to the meter:

0	1	2	3	4
10h	5B/7B	A	CS	16

Answer of the meter:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
68h	L	L	68h	08h	A	72h	Nr_0	Nr_1	Nr_2	Nr_3	34h	2Ch	05h	04h

15	16	17	18	19	20	21-(n-2)	n-1	n
Acc	00h	00h	00h	0Fh	01h	Configuration of the meter	CS	16

Coding of configuration of the meter:

<table>
<tr><td>Offset in bytes</td><td colspan="2">Parameter (format)</td></tr>
<tr><td>0</td><td>Nr_0</td><td rowspan="4">Serial number of meter Nr (Unsigned integer)</td></tr>
<tr><td>1</td><td>Nr_1</td></tr>
<tr><td>2</td><td>Nr_2</td></tr>
<tr><td>3</td><td>Nr_3</td></tr>
<tr><td>4</td><td>$Nr1_0$</td><td rowspan="4">Serial number of 1-st flow sensor Nr1 (Unsigned integer)</td></tr>
<tr><td>5</td><td>$Nr1_1$</td></tr>
<tr><td>6</td><td>$Nr1_2$</td></tr>
<tr><td>7</td><td>$Nr1_3$</td></tr>
<tr><td>8</td><td>$Nr2_0$</td><td rowspan="4">Serial number of 2-nd flow sensor Nr2 (Unsigned integer)</td></tr>
<tr><td>9</td><td>$Nr2_1$</td></tr>
<tr><td>10</td><td>$Nr2_2$</td></tr>
<tr><td>11</td><td>$Nr2_3$</td></tr>
<tr><td>12</td><td>ANr_0</td><td rowspan="4">Customer number (Unsigned integer)</td></tr>
<tr><td>13</td><td>ANr_1</td></tr>
<tr><td>14</td><td>ANr_2</td></tr>
<tr><td>15</td><td>ANr_3</td></tr>
<tr><td>16</td><td>$BatData_0$</td><td rowspan="4">Battery change date (Unsigned integer, seconds since 2004.01.01 00:00)</td></tr>
<tr><td>17</td><td>$BatData_1$</td></tr>
<tr><td>18</td><td>$BatData_{02}$</td></tr>
<tr><td>19</td><td>$BatData_{03}$</td></tr>
<tr><td>20</td><td>ModifAlg</td><td>Code of scheme and code of algorithm:
<table>
<tr><td colspan="8">Bits</td></tr>
<tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td colspan="6">Code of scheme:
0x00 – U1
0x01 – U2
0x03 – U1F
0x04 – U2F
0x05 – U1L
0x06 – U2L
0x07 – U3
0x08 – A
0x09 – A1
0x0A – A1C
0x0B – A2
0x0C – A3
0x0D – A4
0x0E – A5
0x0F – U1A3
0x10 – U2A3
0x11 – F1
0x12 – F2</td><td colspan="2">Code of algorithm</td></tr>
</table></td></tr>
<tr><td>21</td><td>TermoTipai</td><td>Temperature sensors types and status:
<table>
<tr><td colspan="8">Bits</td></tr>
<tr><td colspan="3">7 6 5</td><td>4</td><td>3</td><td>2</td><td colspan="2">1 0</td></tr>
<tr><td colspan="3">Not used</td><td>T3 activation</td><td>T2 activation</td><td>T1 activation</td><td colspan="2">Types:
0 – Pt500
1 – Pt1000
2 – 500П
3 – 1000П</td></tr>
</table></td></tr>
<tr><td>22</td><td>DTipas3</td><td>Type of flow input 3:
<table>
<tr><td colspan="8">Bitai</td></tr>
<tr><td colspan="5">7 6 5 4 3</td><td>2</td><td colspan="2">1 0</td></tr>
<tr><td colspan="5">Not used</td><td>Units:
0 – m^3
1 – t</td><td colspan="2">Type:
0 – Off
1 – S
2 – E
3 – L</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>23</td><td>Not used</td><td></td></tr>
<tr><td>24</td><td>Filtras3</td><td>Minimal pulse period of flow input 3 (integer, msec)</td></tr>
<tr><td>25</td><td>DTipas4</td><td>Type of flow input 4:
<table>
<tr><td colspan="8">Bitai</td></tr>
<tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td colspan="5">Not used</td><td>Units:
0 – m^3
1 – t</td><td colspan="2">Type:
0 – Off
1 – S
2 – E
3 – L</td></tr>
</table></td></tr>
<tr><td>26</td><td>Not used</td><td></td></tr>
<tr><td>27</td><td>DTipas4</td><td>Minimal pulse period of flow input 4 (integer, msec)</td></tr>
<tr><td>28</td><td>DIMP3$_0$</td><td rowspan="4">Pulse value of flow input 3 (float, m^3/pulse)</td></tr>
<tr><td>29</td><td>DIMP3$_1$</td></tr>
<tr><td>30</td><td>DIMP3$_2$</td></tr>
<tr><td>31</td><td>DIMP3$_3$</td></tr>
<tr><td>32</td><td>DIMP3$_0$</td><td rowspan="4">Pulse value of flow input 4 (float, m^3/pulse)</td></tr>
<tr><td>33</td><td>DIMP4$_1$</td></tr>
<tr><td>34</td><td>DIMP4$_2$</td></tr>
<tr><td>35</td><td>DIMP4$_3$</td></tr>
<tr><td>36</td><td>QMIN1$_0$</td><td rowspan="4">Min flow value of flow sensor 1 (float, m^3/h)</td></tr>
<tr><td>37</td><td>QMIN1$_1$</td></tr>
<tr><td>38</td><td>QMIN1$_2$</td></tr>
<tr><td>39</td><td>QMIN1$_3$</td></tr>
<tr><td>40</td><td>QMIN2$_0$</td><td rowspan="4">Min flow value of flow sensor 2 (float, m^3/h)</td></tr>
<tr><td>41</td><td>QMIN2$_1$</td></tr>
<tr><td>42</td><td>QMIN2$_2$</td></tr>
<tr><td>43</td><td>QMIN2$_3$</td></tr>
<tr><td>44</td><td>QMIN3$_0$</td><td rowspan="4">Min flow value of flow input 3 (float, m^3/h)</td></tr>
<tr><td>45</td><td>QMIN3$_1$</td></tr>
<tr><td>46</td><td>QMIN3$_2$</td></tr>
<tr><td>47</td><td>QMIN3$_3$</td></tr>
<tr><td>48</td><td>QMIN4$_0$</td><td rowspan="4">Min flow value of flow input 4 (float, m^3/h)</td></tr>
<tr><td>49</td><td>QMIN4$_1$</td></tr>
<tr><td>50</td><td>QMIN4$_2$</td></tr>
<tr><td>51</td><td>QMIN4$_3$</td></tr>
<tr><td>52</td><td>QMAX1$_0$</td><td rowspan="4">Max flow value of flow sensor 1 (float, m^3/h)</td></tr>
<tr><td>53</td><td>QMAX1$_1$</td></tr>
<tr><td>54</td><td>QMAX1$_2$</td></tr>
<tr><td>55</td><td>QMAX1$_3$</td></tr>
<tr><td>56</td><td>QMAX2$_0$</td><td rowspan="4">Max flow value of flow sensor 2 (float, m^3/h)</td></tr>
<tr><td>57</td><td>QMAX2$_1$</td></tr>
<tr><td>58</td><td>QMAX2$_2$</td></tr>
<tr><td>59</td><td>QMAX2$_3$</td></tr>
<tr><td>60</td><td>QMAX3$_0$</td><td rowspan="4">Max flow value of flow input 3 (float, m^3/h)</td></tr>
<tr><td>61</td><td>QMAX3$_1$</td></tr>
<tr><td>62</td><td>QMAX3$_2$</td></tr>
<tr><td>63</td><td>QMAX3$_3$</td></tr>
<tr><td>64</td><td>QMAX4$_0$</td><td rowspan="4">Max flow value of flow input 4 (float, m^3/h)</td></tr>
<tr><td>65</td><td>QMAX4$_1$</td></tr>
<tr><td>66</td><td>QMAX4$_2$</td></tr>
<tr><td>67</td><td>QMAX4$_3$</td></tr>
<tr><td>68</td><td>KTEMP$_0$</td><td rowspan="2">Cold water temperature constant (integer, 0,01 ^{0}C)</td></tr>
<tr><td>69</td><td>KTEMP$_1$</td></tr>
<tr><td>70</td><td>(T1-T2)min$_0$</td><td rowspan="2">Min temperature difference T1-T2 (integer, 0,01 ^{0}C)</td></tr>
<tr><td>71</td><td>(T1-T2)min$_1$</td></tr>
<tr><td>72</td><td>SMIN$_0$</td><td rowspan="2">Min value of pressure sensors (integer, 0,1 kPa)</td></tr>
<tr><td>73</td><td>SMIN$_1$</td></tr>
</table>

<table>
<tr><td>74</td><td>SMAX$_0$</td><td rowspan="2">Max value of pressure sensors (integer, 0,1 kPa)</td></tr>
<tr><td>75</td><td>SMAX$_1$</td></tr>
<tr><td>76</td><td>SENT$_0$</td><td rowspan="2">Value of pressure for calculations (integer, 0,1 kPa)</td></tr>
<tr><td>77</td><td>SENT$_1$</td></tr>
<tr><td>78</td><td>SIRIB</td><td colspan="2">Limits of current of pressure sensors inputs:
0x00 – 0-20 mA
0x01 – 4-20 mA
0x02 – 0-4 mA</td></tr>
<tr><td>79</td><td>MBusAddr</td><td colspan="2">M-Bus adresas</td></tr>
<tr><td>80</td><td>UARTSpeed1</td><td>Boud rate of wire interface</td><td rowspan="2">Bits
7 | 6 5 4 3 2 1 0
0 – None parity
1 – Even parity
0x00 – 300 bps
0x01 – 600 bps
0x02 – 1200 bps
0x03 – 2400 bps
0x04 – 4800 bps
0x05 – 9600 bps
0x06 – 19200 bps
0x07 – 38400 bps</td></tr>
<tr><td>81</td><td>UARTSpeed2</td><td>Boud rate of optical interface</td></tr>
<tr><td>82</td><td>PPULS1</td><td>Parameter for 1st pulse/frequency output</td><td rowspan="2">0x00 – Off
0x01 – Energy (total)
0x02 – Energy 1
0x03 – Energy 2
0x04 – Volume V1
0x05 – Volume V2
0x06 – Volume –V2
0x07 – Volume V3
0x08 – Volume V4
0x09 – Mass M1
0x0A – Mass M2
0x0B – Mass –M2
0x0C – Mass M3
0x0D – Power
0x0E – Flow q1
0x0F – Flow q2
0x10 – Flow q3
0x11 – Flow q4
0x12 – Temperature T1
0x13 – Temperature T2
0x14 – Temperature (T1-T2)
0x15 – Temperature T3
0x16 – Presse p1
0x17 – Presse p2</td></tr>
<tr><td>83</td><td>PPULS2</td><td>Parameter for 2nd pulse/frequency output</td></tr>
<tr><td>84</td><td>PKALBA</td><td colspan="2">Report printing language and interface:
Bits
7 | 6 5 4 3 2 1 0
Interface for printig:
0 – wire
1 – optical
Language:
0x00 – English
0x01 – Russian
0x02 – Lithuanian</td></tr>
<tr><td>85</td><td>MATVNT</td><td colspan="2">Units:
Bits
7 6 5 4 | 3 | 2 | 1 0
Not used
V2 units:
0 – m^3
1 – t
V1 units:
0 – m^3
1 – t
Energy:
0x00 – MWh
0x01 – Gcal
0x02 - GJ</td></tr>
</table>