



Energy calculator Infocal 9 M-bus communication protocol description



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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	09h	07h	03h	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: „Nr₀... Nr₃“ – Serial number of meter,

11, 12 bytes: „09h,07h“ – Manufacturer code (AXI)

13 byte: „03h“ – 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 1** (for 1st heating system, except scheme U0).
2. **Energy 2** (for 2nd heating system, except scheme U0).
3. **Energy 3** (for 1st heating system for schemes A1, A2 and A4).
4. **Volume (or mass) 1** (when flow input 1 is active).
5. **Volume (or mass) 2 1** (when flow input 2 is active).

6. **Volume (or mass) -2** (when flow input 2 is active, A1 scheme and algorithm 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. **Volume 5** (when flow input 5 is active).
10. **Power 1** (except scheme U0).
11. **Power 2** (except scheme U0).
12. **Power 3** (for 1st heating system for schemes A1, A2 and A4).
13. **Flow 1** (when flow input 1 is active).
14. **Flow 2** (when flow input 2 is active).
15. **Flow 3** (when flow input 3 is active).
16. **Flow 4** (when flow input 4 is active).
17. **Flow 5** (when flow input 5 is active).
18. **Temperature 1** (when temperature input 1 is active).
19. **Temperature 2** (when temperature input 2 is active).
20. **Temperature 3** (when temperature input 3 is active).
21. **Temperature 4** (when temperature input 4 is active).
22. **Temperature 5** (when temperature input 5 is active).
23. **Pressure 1** (when pressure input 1 is active).
24. **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	DIB	VIB								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	
1 st energy	04	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
2 nd energy	84 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
3 ^d energy	84 80 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)

Volume (or mass)

Parameter	DIB	VIB								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) 5	84 80 80 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) -2	84 C0 80 40	16	96	15	95	14	94	13	93	4 bytes (long)

Power

Parameter	DIB	VIB	Data
Power 1	05	2E	4 bytes (float) kW
Power 2	85 40	2E	4 bytes (float) kW
Power 3	85 80 40	2E	4 bytes (float) kW

Flow

Parameter	DIB	VIB	Data
Flow 1	05	3E	4 bytes (float) m ³ /h
Flow 2	85 40	3E	4 bytes (float) m ³ /h
Flow 3	85 80 40	3E	4 bytes (float) m ³ /h
Flow 4	85 C0 40	3E	4 bytes (float) m ³ /h
Flow 5	85 80 80 40	3E	4 bytes (float) m ³ /h

Temperature

Parametras	DIB	VIB	Data
Temperature 1	02	59	2 bytes (word), 0,01°C
Temperature 2	02	5D	2 bytes (word), 0,01°C
Temperature 3	82 40	59	2 bytes (word), 0,01°C
Temperature 4	82 40	5D	2 bytes (word), 0,01°C
Temperature 5	02	65	2 bytes (word), 0,01°C

Pressure

Parametras	DIB	VIB	Data
Pressure 1	03	68	3 bytes (word) 0,1 kPa
Pressure 1	83 40	68	3 bytes (word) 0,1 kPa

Current date/time

Parameter	DIB	VIB	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=Year₁|Year₀ (Year₀ – low significant part, Year₁ – high significant part) <0 to 99>

Error codes

Parameter	DIB	VIB	Data
Error code Er ²	02	FD 17	2 bytes (error code format)
Error code Er ¹	82 40	FD 17	2 bytes (error code format)
Error code Er ²	82 80 40	FD 17	2 bytes (error code format)

Format of error code Er² is following:

Bytes																			
1							0												
Bits																			
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00				
Bits of error code																			
			3	2	1	0	3				2	1	0	3			2	1	0
Not used (=0)			Calculator operation error code				2 nd heating system operation error code				1 st heating system operation error code								

Format of error code Er¹ is following:

Bytes																				
1							0													
Bits																				
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00					
Bits of error code																				
			3	2	1	3			2	1	3			2	1	3			2	1
0	Status code of flow sensor 5			Status code of flow sensor 4			Status code of flow sensor 3			Status code of flow sensor 2			Status code of flow sensor 1							

Format of error code Er² is following:

Bytes																				
1							0													
Bits																				
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00					
Bits of error code																				
			3	1	0	3			1	0	3			1	0	3			1	0
0	Status code of temperature sensor 5			Status code of temperature sensor 4			Status code of temperature sensor 3			Status code of temperature sensor 2			Status code of temperature sensor 1							

Power supply duration

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

Normal working time

Parameter	DIB	VIB	Data
For 1 st heating system	04	24	4 bytes (long integer, time in seconds)
For 2 nd heating system	84 40	24	4 bytes (long integer, time in seconds)

Additional control sum (CRC-16)

Parameter	DIB	VIB	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	03h	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 1** (for 1st heating system, except scheme U0).
2. **Energy 2** (for 2nd heating system, except scheme U0).
3. **Energy 3** (for 1st heating system for schemes A1, A2 and A4).
4. **Volume (or mass) 1** (when flow input 1 is active).
5. **Volume (or mass) 2 1** (when flow input 2 is active).
6. **Volume (or mass) -2** (when flow input 2 is active, A1 scheme and algorithm 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. **Volume 5** (when flow input 5 is active).
10. **Power 1** (except scheme U0).
11. **Power 2** (except scheme U0).
12. **Power 3** (for 1st heating system for schemes A1, A2 and A4).
13. **Flow 1** (when flow input 1 is active).
14. **Flow 2** (when flow input 2 is active).
15. **Flow 3** (when flow input 3 is active).

16. **Flow 4** (when flow input 4 is active).
17. **Flow 5** (when flow input 5 is active).
18. **Temperature 1** (when temperature input 1 is active).
19. **Temperature 2** (when temperature input 2 is active).
20. **Temperature 3** (when temperature input 3 is active).
21. **Temperature 4** (when temperature input 4 is active).
22. **Temperature 5** (when temperature input 5 is active).
23. **Pressure 1** (when pressure input 1 is active).
24. **Pressure 2** (when pressure input 2 is active).

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

25. **Current date/time of the meter**
26. **Error codes**
27. **Power supply duration**
28. **Normal working time**
29. **Additional control sum (CRC-16)**

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

1. **Duration of failure (failure in 1st and/or 2nd heating system)**
2. **1st heating system failure duration.**
3. **2nd heating system failure duration.**
4. **Duration, when flow q1 > q1max.**
5. **Duration, when flow q2 > q2max.**
6. **Duration, when flow q3 > q3max.**
7. **Duration, when flow q4 > q4max.**
8. **Duration, when flow q1 < q1min.**
9. **Duration, when flow q2 < q2min.**
10. **Duration, when flow q3 < q3min.**
11. **Duration, when flow q4 < q4min.**
12. **Duration, when temperature difference (T1-T2) < (T1-T2)min.**
13. **Duration, when temperature difference (T3-T4) < (T3-T4)min.**

Coding of parameters:

Energy

Parameter	DIB	VIB								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	
1 st energy	04	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
2 nd energy	84 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
3 rd energy	84 80 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)

Volume (or mass)

Parameter	DIB	VIB								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) 5	84 80 80 40	16	96	15	95	14	94	13	93	4 bytes (long)
Volume (mass) -2	84 C0 80 40	16	96	15	95	14	94	13	93	4 bytes (long)

Temperature (average)

Parametras	DIB	VIB	Data
Temperature 1	02	59	2 bytes (word), 0,01°C
Temperature 2	02	5D	2 bytes (word), 0,01°C
Temperature 3	82 40	59	2 bytes (word), 0,01°C
Temperature 4	82 40	5D	2 bytes (word), 0,01°C
Temperature 5	02	65	2 bytes (word), 0,01°C

Pressure (average)

Parametras	DIB	VIB	Data
Pressure 1	03	68	3 bytes (word) 0,1 kPa
Pressure 1	83 40	68	3 bytes (word) 0,1 kPa

Date and time of records

Parameter	DIB	VIB	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=Year₁|Year₀ (Year₀ – low significant part, Year₁ – high significant part) <0 to 99>

Error codes

Parameter	DIB	VIB	Data
Error code Er ^z	02	FD 17	2 bytes (error code format)
Error code Er ¹	82 40	FD 17	2 bytes (error code format)
Error code Er ²	82 80 40	FD 17	2 bytes (error code format)

Format of error code Er^z is following:

Bytes																			
1							0												
Bits																			
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00				
Bits of error code																			
			3	2	1	0	3				2	1	0	3			2	1	0
Not used (=0)			Calculator operation error code				2 nd heating system operation error code				1 st heating system operation error code								

Format of error code Er¹ is following:

Bytes																				
1							0													
Bits																				
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00					
Bits of error code																				
			3	2	1	3			2	1	3			2	1	3			2	1
0	Status code of flow sensor 5			Status code of flow sensor 4			Status code of flow sensor 3			Status code of flow sensor 2			Status code of flow sensor 1							

Format of error code Er² is following:

Bytes																				
1							0													
Bits																				
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00					
Bits of error code																				
			3	1	0	3			1	0	3			1	0	3			1	0
0	Status code of temperature sensor 5			Status code of temperature sensor 4			Status code of temperature sensor 3			Status code of temperature sensor 2			Status code of temperature sensor 1							

Power on duration

Parameter	DIB	VIB	Data
Power on duration	04	20	4 bytes (long integer, time in seconds)

Power supply duration

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

Normal working time

Parameter	DIB	VIB	Data
For 1 st heating system	04	24	4 bytes (long integer, time in seconds)
For 2 nd heating system	84 40	24	4 bytes (long integer, time in seconds)

Additional control sum (CRC-16)

Parameter	DIB	VIB	Data
Additional control sum (CRC-16)	02	7F	2 bytes

Duration of errors

Parameter	DIB	VIB	Data
Duration of failure (failure in 1 st and/or 2 nd heating system)	04	74	4 bytes (long integer, time in seconds)
1 st heating system failure duration	84 40	74	4 bytes (long integer, time in seconds)
2 nd heating system failure duration	84 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_1 > q_{1max}$	84 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_2 > q_{2max}$	84 80 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_3 > q_{3max}$	84 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_4 > q_{4max}$	84 80 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_1 < q_{1min}$	84 C0 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_2 < q_{2min}$	84 80 80 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_3 < q_{3min}$	84 C0 80 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow $q_4 < q_{4min}$	84 80 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration, when temperature difference $(T_1-T_2) < (T_1-T_2)_{min}$	84 C0 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration, when temperature difference $(T_3-T_4) < (T_3-T_4)_{min}$	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 ... 9 sub-meters.

Possible meter response telegrams, depending on the address code, secondary address type meter configuration code bits (B0.. B9) 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)
{Nr}	Transmitted parameters E_{Σ} , ton, coded as E, ton	When code over than „B1=1 and B0,B2...B7=0“ and E_{Σ} is on
{Nr}	Transmitted parameters E_1 , V_1 (or M_1), P_1 , q_1 , T_1 , T_2 , T_5 , p_1 , p_2 , ton, td_1 , coded as E, V(or M), P, q, T_1 , T_2 , T_5 , p_1 , p_2 , ton, td	When B1=1 and B0,B2...B7=0, and 1 st heating scheme no U2 or A2
{Nr}	Transmitted parameters E_1 , V_2 (or M_2), P_1 , q_1 , T_1 , T_2 , T_5 , p_1 , p_2 , ton, td_1 , coded as E, V(or M), P, q, T_1 , T_2 , T_5 , p_1 , p_2 , ton, td	When B1=1 and B0,B2...B7=0, and 1 st heating scheme U2 or A2
{1000000+N _r }	Transmitted parameters E_1 , V_1 (or M_1), P_1 , q_1 , T_1 , T_2 , T_5 , p_1 , p_2 , ton, td_1 , coded as E, V(or M), P, q, T_1 , T_2 , T_5 , p_1 , p_2 , ton, td	B1=1 and 1 st flow channel is on, and 1 st heating scheme no U2 or A2
{1000000+N _r }	Transmitted parameters E_1 , V_2 (or M_2), P_1 , q_1 , T_1 , T_2 , T_5 , p_1 , p_2 , ton, td_1 , coded as E, V(or M), P, q, T_1 , T_2 , T_5 , p_1 , p_2 , ton, td	B1=1 and 2 nd flow channel is on, and 1 st heating scheme U2 or A2
{2000000+N _r }	Transmitted parameters E_2 , V_3 (or M_3), P_2 , q_3 , T_3 , T_4 , p_1 , p_2 , ton, td_2 , coded as E, V(or M), P, q, T_1 , T_2 , p_1 , p_2 , ton, td	B2=1 and 3 rd flow channel is on, and 2 nd heating scheme no U2
{2000000+N _r }	Transmitted parameters E_2 , V_3 (or M_3), P_2 , q_3 , T_1 , T_2 , p_1 , p_2 , ton, td_2 , coded as E, V(or M), P, q, T_1 , T_2 , p_1 , p_2 , ton, td	B2=1 and 4 th flow channel is on, and 2 nd heating scheme U2
{3000000+N _r }	Transmitted parameters V_2 (or M_2), q_2 , coded as V(or M), q	B3=1 and 2 nd flow channel is on, and 1 st heating scheme no U2
{3000000+N _r }	Transmitted parameters V_1 (or M_1), q_1 , coded as V(or M), q	B3=1 and 1 st flow channel is on, and 1 st heating scheme U2
{4000000+N _r }	Transmitted parameters V_4 (or M_4), q_4 , coded as V(or M), q	B4=1 and 4 th flow channel is on, and 2 nd heating scheme no U2
{4000000+N _r }	Transmitted parameters V_3 (or M_3), q_3 , coded as V(or M), q	B4=1 and 3 rd flow channel is on, and 2 nd heating scheme U2
{5000000+N _r }	Transmitted parameters V_5 , q_5 , coded as V, q	B5=1 and 5 th flow channel is on
{6000000+N _r }	Days archive	B6=1
{7000000+N _r }	Hours archive	B7=1
{8000000+N _r }	Days archive from end of last month	B8=1
{9000000+N _r }	Hours archive from end of last month	B9=1

Here:

- E – energy (total energy $E_{\Sigma} = E_1 + E_2$)
- V – volume (M – mass)
- P – power
- q – flow
- T – temperature
- p – pressure
- ton – power supply duration
- td – normal working time
- 1...5 – number of channel (or heating system)

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	03h	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					

Offset in bytes	Parameter (format)	
0	Nr ₀	Serial number (Unsigned integer)
1	Nr ₁	
2	Nr ₂	
3	Nr ₃	
4	ANr ₀	Customer number (Unsigned integer)
5	ANr ₁	
6	ANr ₂	
7	ANr ₃	
8	BatData ₀	Battery change date (Unsigned integer, seconds since 2004.01.01 00:00)
9	BatData ₁	
10	BatData ₀₂	
11	BatData ₀₃	
12	Modif1	Code of scheme of 1 st system: 0x00 – U0 0x01 – U1 0x02 – U2 0x03 – U3 0x04 – A1 0x05 – A2 0x06 – A3 0x07 – A4
13	Alg1	Code of algorithm of 1 st system
14	Modif2	Code of scheme of 2 nd system: 0x00 – U0 0x01 – U1 0x02 – U2 0x03 – U3
15	Alg2	Code of algorithm of 2 nd system

16	DSAR	List of active flow inputs <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="8">Bits</th> </tr> <tr> <th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th> </tr> </thead> <tbody> <tr> <td>0</td><td>0</td><td>0</td><td>q5</td><td>q4</td><td>q3</td><td>q2</td><td>q1</td> </tr> </tbody> </table>	Bits								7	6	5	4	3	2	1	0	0	0	0	q5	q4	q3	q2	q1
Bits																										
7	6	5	4	3	2	1	0																			
0	0	0	q5	q4	q3	q2	q1																			
17	TSAR	List of active temperature inputs <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="8">Bits</th> </tr> <tr> <th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th> </tr> </thead> <tbody> <tr> <td>0</td><td>0</td><td>0</td><td>T5</td><td>T4</td><td>T3</td><td>T2</td><td>T1</td> </tr> </tbody> </table>	Bits								7	6	5	4	3	2	1	0	0	0	0	T5	T4	T3	T2	T1
Bits																										
7	6	5	4	3	2	1	0																			
0	0	0	T5	T4	T3	T2	T1																			
18	SSAR	List of active pressure inputs <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="8">Bits</th> </tr> <tr> <th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th> </tr> </thead> <tbody> <tr> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>p2</td><td>p1</td> </tr> </tbody> </table>	Bits								7	6	5	4	3	2	1	0	0	0	0	0	0	0	p2	p1
Bits																										
7	6	5	4	3	2	1	0																			
0	0	0	0	0	0	p2	p1																			
19	TGRAD1	Code off temperature sensor 1 type	0x00 – PT500 0x01 – PT1000 0x02 – 500Π 0x03 – 1000Π																							
20	TGRAD2	Code off temperature sensor 2 type																								
21	TGRAD3	Code off temperature sensor 3 type																								
22	TGRAD4	Code off temperature sensor 4 type																								
23	TGRAD5	Code off temperature sensor 5 type																								
24	DTIP1	Flow sensor 1 type																								
25	DIM1	Units of flow measuring channel 1: 0x00 – m ³ 0x01 – t																								
26	DADF1 ₀	Minimal pulse period of flow input 1 (integer, msec)																								
27	DADF1 ₁																									
28	DTIP2	Flow sensor 2 type																								
29	DIM2	Units of flow measuring channel 2: 0x00 – m ³ 0x01 – t																								
30	DADF2 ₀	Minimal pulse period of flow input 2 (integer, msec)																								
31	DADF2 ₁																									
32	DTIP3	Flow sensor 3 type																								
33	DIM3	Units of flow measuring channel 3: 0x00 – m ³ 0x01 – t																								
34	DADF3 ₀	Minimal pulse period of flow input 3 (integer, msec)																								
35	DADF3 ₁																									
36	DTIP4	Flow sensor 4 type																								
37	DIM4	Units of flow measuring channel 4: 0x00 – m ³ 0x01 – t																								
38	DADF4 ₀	Minimal pulse period of flow input 4 (integer, msec)																								
39	DADF4 ₁																									
40	DTIP5	Flow sensor 5 type (visada 0x00)																								
41	DIM5	Not used (0x00)																								
42	DADF5 ₀	Minimal pulse period of flow input 5 (integer, msec)																								
43	DADF5 ₁																									
44	DIMP1 ₀	Pulse value of flow input 1 (float, m ³ /pulse)																								
45	DIMP1 ₁																									
46	DIMP1 ₂																									
47	DIMP1 ₃																									
48	DIMP2 ₀	Pulse value of flow input 2 (float, m ³ /pulse)																								
49	DIMP2 ₁																									
50	DIMP2 ₂																									
51	DIMP2 ₃																									
52	DIMP3 ₀	Pulse value of flow input 3 (float, m ³ /pulse)																								
53	DIMP3 ₁																									
54	DIMP3 ₂																									
55	DIMP3 ₃	Pulse value of flow input 4 (float, m ³ /pulse)																								
56	DIMP4 ₀																									
57	DIMP4 ₁																									

58	DIMP4 ₂	
59	DIMP4 ₃	
60	DIMP5 ₀	
61	DIMP5 ₁	Pulse value of flow input 5 (float, m ³ /pulse)
62	DIMP5 ₂	
63	DIMP5 ₃	
64	QMAX1 ₀	Max flow of flow input 1 (float, m ³ /h)
65	QMAX1 ₁	
66	QMAX1 ₂	
67	QMAX1 ₃	Max flow of flow input 2 (float, m ³ /h)
68	QMAX2 ₀	
69	QMAX2 ₁	
70	QMAX2 ₂	Max flow of flow input 3 (float, m ³ /h)
71	QMAX2 ₃	
72	QMAX3 ₀	
73	QMAX3 ₁	Max flow of flow input 4 (float, m ³ /h)
74	QMAX3 ₂	
75	QMAX3 ₃	
76	QMAX4 ₀	Max flow of flow input 5 (float, m ³ /h)
77	QMAX4 ₁	
78	QMAX4 ₂	
79	QMAX4 ₃	Min flow of flow input 1 (float, m ³ /h)
80	QMAX5 ₀	
81	QMAX5 ₁	
82	QMAX5 ₂	Min flow of flow input 2 (float, m ³ /h)
83	QMAX5 ₃	
84	QMIN1 ₀	
85	QMIN1 ₁	Min flow of flow input 3 (float, m ³ /h)
86	QMIN1 ₂	
87	QMIN1 ₃	
88	QMIN2 ₀	Min flow of flow input 4 (float, m ³ /h)
89	QMIN2 ₁	
90	QMIN2 ₂	
91	QMIN2 ₃	Max projected value of flow of flow input 1 (float, m ³ /h)
92	QMIN3 ₀	
93	QMIN3 ₁	
94	QMIN3 ₂	Max projected value of flow of flow input 2 (float, m ³ /h)
95	QMIN3 ₃	
96	QMIN4 ₀	
97	QMIN4 ₁	Max projected value of flow of flow input 3 (float, m ³ /h)
98	QMIN4 ₂	
99	QMIN4 ₃	
100	QPMAX1 ₀	Max projected value of flow of flow input 4 (float, m ³ /h)
101	QPMAX1 ₁	
102	QPMAX1 ₂	
103	QPMAX1 ₃	Min projected value of flow of flow input 1 (float, m ³ /h)
104	QPMAX2 ₀	
105	QPMAX2 ₁	
106	QPMAX2 ₂	Max projected value of flow of flow input 2 (float, m ³ /h)
107	QPMAX2 ₃	
108	QPMAX3 ₀	
109	QPMAX3 ₁	Max projected value of flow of flow input 3 (float, m ³ /h)
110	QPMAX3 ₂	
111	QPMAX3 ₃	
112	QPMAX4 ₀	Max projected value of flow of flow input 4 (float, m ³ /h)
113	QPMAX4 ₁	
114	QPMAX4 ₂	
115	QPMAX4 ₃	Max projected value of flow of flow input 5 (float, m ³ /h)
116	QPMIN1 ₀	

117	QPMIN1 ₁									
118	QPMIN1 ₂									
119	QPMIN1 ₃									
120	QPMIN2 ₀	Min projected value of flow of flow input 2 (float, m ³ /h)								
121	QPMIN2 ₁									
122	QPMIN2 ₂									
123	QPMIN2 ₃									
124	QPMIN3 ₀	Min projected value of flow of flow input 3 (float, m ³ /h)								
125	QPMIN3 ₁									
126	QPMIN3 ₂									
127	QPMIN3 ₃									
128	QPMIN4 ₀	Min projected value of flow of flow input 4 (float, m ³ /h)								
129	QPMIN4 ₁									
130	QPMIN4 ₂									
131	QPMIN4 ₃									
132	KTEMP ₀	Cold water temperature constant (integer, 0,01 °C)								
133	KTEMP ₁									
134	(T1-T2)min ₀	Min temperature difference T1-T2 (integer, 0,01 °C)								
135	(T1-T2)min ₁									
136	(T3-T4)min ₀	Min temperature difference T3-T4 (integer, 0,01 °C)								
137	(T3-T4)min ₁									
138	(T1-T2)Pmin ₀	Min projektet temperature difference T1-T2 (integer, 0,01 °C)								
139	(T1-T2)Pmin ₁									
140	(T3-T4)Pmin ₀	Min projektet temperature difference T3-T4 (integer, 0,01 °C)								
141	(T3-T4)Pmin ₁									
142	SIRIB1	Limits of current of pressure sensor input 1	0x00 – 0-20 mA 0x01 – 4-20 mA 0x02 – 0-4 mA							
143	SIRIB2	Limits of current of pressure sensor input 2								
144	SMAX1 ₀	Max value of pressure sensor 1 (integer, 0,1 kPa)								
145	SMAX1 ₁									
146	SMAX2 ₀	Max value of pressure sensor 2 (integer, 0,1 kPa)								
147	SMAX2 ₁									
148	SENT1 ₀	Value of pressure for calculations for 1 st system (integer, 0,1 kPa)								
149	SENT1 ₁									
150	SENT2 ₀	Value of pressure for calculations for 2 nd system (integer, 0,1 kPa)								
151	SENT2 ₁									
152	MBusAddr	M-Bus address								
153	UARTSpeed1	Boud rate of wire interface	Bits							
			7	6	5	4	3	2	1	0
154	UARTSpeed2	Boud rate of optical interface	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							
155	DimUnits	Units of energy: 0x00 – MWh 0x01 – Gcal 0x02 - GJ								
156	PKALBA	Report printing language: 0x00 – English 0x01 – Russian 0x02 – Lithuanian								