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: „Nr_0... Nr_3“ – 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 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. **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	
1st energy	04	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
2nd energy	84 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
3d 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=$Year_1$|$Year_0$ ($Year_0$ – low significant part, $Year_1$ – high significant part) <0 to 99>

Error codes

Parameter	DIB	VIB	Data
Error code Er^{Σ}	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^{Σ} 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 Er^{1} 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	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 Er^{2} 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	3	1	0
0	Status code of tem- perature sensor 5			Status code of tem- perature sensor 4			Status code of tem- perature sensor 3			Status code of tem- perature sensor 2			Status code of tem- perature 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 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. **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	
1st energy	04	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
2nd energy	84 40	FB 00	FB 08	07	0F	06	0E	05	0D	4 bytes (long)
3d 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=$Year_1$|$Year_0$ ($Year_0$ – low significant part, $Year_1$ – high significant part) <0 to 99>

Error codes

Parameter	DIB	VIB	Data
Error code Er^{Σ}	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^{Σ} 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				2nd heating system operation error code				1st heating system operation error code			

Format of error code Er^{1} 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	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 Er^{2} 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	3	1	0
0	Status code of tem- perature sensor 5			Status code of tem- perature sensor 4			Status code of tem- perature sensor 3			Status code of tem- perature sensor 2			Status code of tem- perature 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 1st heating system	04	24	4 bytes (long integer, time in seconds)
For 2nd 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 1st and/or 2nd heating system)	04	74	4 bytes (long integer, time in seconds)
1st heating system failure duration	84 40	74	4 bytes (long integer, time in seconds)
2nd heating system failure duration	84 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q1 > q1max	84 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q2 > q2max	84 80 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q3 > q3max	84 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q4 > q4max	84 80 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q1 < q1min	84 C0 C0 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q2 < q2min	84 80 80 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q3 < q3min	84 C0 80 80 40	74	4 bytes (long integer, time in seconds)
Duration, when flow q4 < q4min	84 80 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration, when temperature difference (T1-T2) < (T1-T2)min	84 C0 C0 80 40	74	4 bytes (long integer, time in seconds)
Duration, when temperature difference (T3-T4) < (T3-T4)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_s, p_1, p_2, ton, td	When B1=1 and B0,B2…B7=0, and 1st 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_s, p_1, p_2, ton, td	When B1=1 and B0,B2…B7=0, and 1st heating scheme U2 or A2
{1000000+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_s, p_1, p_2, ton, td	B1=1 and 1st flow channel is on, and 1st heating scheme no U2 or A2
{1000000+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_s, p_1, p_2, ton, td	B1=1 and 2nd flow channel is on, and 1st heating scheme U2 or A2
{2000000+Nr}	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 3d flow channel is on, and 2nd heating scheme no U2
{2000000+Nr}	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 4th flow channel is on, and 2nd heating scheme U2
{3000000+Nr}	Transmitted parameters V_2(or M_2), q_2, coded as V (or M), q	B3=1 and 2nd flow channel is on, and 1st heating scheme no U2
{3000000+Nr}	Transmitted parameters V_1(or M_1), q_1, coded as V (or M), q	B3=1 and 1st flow channel is on, and 1st heating scheme U2
{4000000+Nr}	Transmitted parameters V_4(or M_4), q_4, coded as V (or M), q	B4=1 and 4th flow channel is on, and 2nd heating scheme no U2
{4000000+Nr}	Transmitted parameters V_3(or M_3), q_3, coded as V (or M), q	B4=1 and 3d flow channel is on, and 2nd heating scheme U2
{5000000+Nr}	Transmitted parameters V_5, q_5, coded as V, q	B5=1 and 5th flow channel is on
{6000000+Nr}	Days archive	B6=1
{7000000+Nr}	Hours archive	B7=1
{8000000+Nr}	Days archive from end of last month	B8=1
{9000000+Nr}	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 1st system: 0x00 – U0 0x01 – U1 0x02 – U2 0x03 – U3 0x04 – A1 0x05 – A2 0x06 – A3 0x07 – A4
13	Alg1	Code of algorithm of 1st system
14	Modif2	Code of scheme of 2nd system: 0x00 – U0 0x01 – U1 0x02 – U2 0x03 – U3
15	Alg2	Code of algorithm of 2nd system

<table>
<tr><td>16</td><td>DSAR</td><td>List of active flow inputs<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>0</td><td>0</td><td>0</td><td>q5</td><td>q4</td><td>q3</td><td>q2</td><td>q1</td></tr></table></td></tr>
<tr><td>17</td><td>TSAR</td><td>List of active temperature inputs<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>0</td><td>0</td><td>0</td><td>T5</td><td>T4</td><td>T3</td><td>T2</td><td>T1</td></tr></table></td></tr>
<tr><td>18</td><td>SSAR</td><td>List of active pressure inputs<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>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>p2</td><td>p1</td></tr></table></td></tr>
<tr><td>19</td><td>TGRAD1</td><td>Code off temperature sensor 1 type</td><td rowspan="5">0x00 – PT500
0x01 – PT1000
0x02 – 500П
0x03 – 1000П</td></tr>
<tr><td>20</td><td>TGRAD2</td><td>Code off temperature sensor 2 type</td></tr>
<tr><td>21</td><td>TGRAD3</td><td>Code off temperature sensor 3 type</td></tr>
<tr><td>22</td><td>TGRAD4</td><td>Code off temperature sensor 4 type</td></tr>
<tr><td>23</td><td>TGRAD5</td><td>Code off temperature sensor 5 type</td></tr>
<tr><td>24</td><td>DTIP1</td><td colspan="2">Flow sensor 1 type</td></tr>
<tr><td>25</td><td>DIM1</td><td colspan="2">Units of flow measuring channel 1:
0x00 – m^3
0x01 – t</td></tr>
<tr><td>26</td><td>$DADF1_0$</td><td colspan="2" rowspan="2">Minimal pulse period of flow input 1 (integer, msec)</td></tr>
<tr><td>27</td><td>$DADF1_1$</td></tr>
<tr><td>28</td><td>DTIP2</td><td colspan="2">Flow sensor 2 type</td></tr>
<tr><td>29</td><td>DIM2</td><td colspan="2">Units of flow measuring channel 2:
0x00 – m^3
0x01 – t</td></tr>
<tr><td>30</td><td>$DADF2_0$</td><td colspan="2" rowspan="2">Minimal pulse period of flow input 2 (integer, msec)</td></tr>
<tr><td>31</td><td>$DADF2_1$</td></tr>
<tr><td>32</td><td>DTIP3</td><td colspan="2">Flow sensor 3 type</td></tr>
<tr><td>33</td><td>DIM3</td><td colspan="2">Units of flow measuring channel 3:
0x00 – m^3
0x01 – t</td></tr>
<tr><td>34</td><td>$DADF3_0$</td><td colspan="2" rowspan="2">Minimal pulse period of flow input 3 (integer, msec)</td></tr>
<tr><td>35</td><td>$DADF3_1$</td></tr>
<tr><td>36</td><td>DTIP4</td><td colspan="2">Flow sensor 4 type</td></tr>
<tr><td>37</td><td>DIM4</td><td colspan="2">Units of flow measuring channel 4:
0x00 – m^3
0x01 – t</td></tr>
<tr><td>38</td><td>$DADF4_0$</td><td colspan="2" rowspan="2">Minimal pulse period of flow input 4 (integer, msec)</td></tr>
<tr><td>39</td><td>$DADF4_1$</td></tr>
<tr><td>40</td><td>DTIP5</td><td colspan="2">Flow sensor 5 type (visada 0x00)</td></tr>
<tr><td>41</td><td>DIM5</td><td colspan="2">Not used (0x00)</td></tr>
<tr><td>42</td><td>$DADF5_0$</td><td colspan="2" rowspan="2">Minimal pulse period of flow input 5 (integer, msec)</td></tr>
<tr><td>43</td><td>$DADF5_1$</td></tr>
<tr><td>44</td><td>$DIMP1_0$</td><td colspan="2" rowspan="4">Pulse value of flow input 1 (float, m^3/pulse)</td></tr>
<tr><td>45</td><td>$DIMP1_1$</td></tr>
<tr><td>46</td><td>$DIMP1_2$</td></tr>
<tr><td>47</td><td>$DIMP1_3$</td></tr>
<tr><td>48</td><td>$DIMP2_0$</td><td colspan="2" rowspan="4">Pulse value of flow input 2 (float, m^3/pulse)</td></tr>
<tr><td>49</td><td>$DIMP2_1$</td></tr>
<tr><td>50</td><td>$DIMP2_2$</td></tr>
<tr><td>51</td><td>$DIMP2_3$</td></tr>
<tr><td>52</td><td>$DIMP3_0$</td><td colspan="2" rowspan="4">Pulse value of flow input 3 (float, m^3/pulse)</td></tr>
<tr><td>53</td><td>$DIMP3_1$</td></tr>
<tr><td>54</td><td>$DIMP3_2$</td></tr>
<tr><td>55</td><td>$DIMP3_3$</td></tr>
<tr><td>56</td><td>$DIMP4_0$</td><td colspan="2" rowspan="2">Pulse value of flow input 4 (float, m^3/pulse)</td></tr>
<tr><td>57</td><td>$DIMP4_1$</td></tr>
</table>

58	$DIMP4_2$	
59	$DIMP4_3$	
60	$DIMP5_0$	Pulse value of flow input 5 (float, m^3/pulse)
61	$DIMP5_1$	
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	$QMAX1_3$	
68	$QMAX2_0$	Max flow of flow input 2 (float, m^3/h)
69	$QMAX2_1$	
70	$QMAX2_2$	
71	$QMAX2_3$	
72	$QMAX3_0$	Max flow of flow input 3 (float, m^3/h)
73	$QMAX3_1$	
74	$QMAX3_2$	
75	$QMAX3_3$	
76	$QMAX4_0$	Max flow of flow input 4 (float, m^3/h)
77	$QMAX4_1$	
78	$QMAX4_2$	
79	$QMAX4_3$	
80	$QMAX5_0$	Max flow of flow input 5 (float, m^3/h)
81	$QMAX5_1$	
82	$QMAX5_2$	
83	$QMAX5_3$	
84	$QMIN1_0$	Min flow of flow input 1 (float, m^3/h)
85	$QMIN1_1$	
86	$QMIN1_2$	
87	$QMIN1_3$	
88	$QMIN2_0$	Min flow of flow input 2 (float, m^3/h)
89	$QMIN2_1$	
90	$QMIN2_2$	
91	$QMIN2_3$	
92	$QMIN3_0$	Min flow of flow input 3 (float, m^3/h)
93	$QMIN3_1$	
94	$QMIN3_2$	
95	$QMIN3_3$	
96	$QMIN4_0$	Min flow of flow input 4 (float, m^3/h)
97	$QMIN4_1$	
98	$QMIN4_2$	
99	$QMIN4_3$	
100	$QPMAX1_0$	Max projected value of flow of flow input 1 (float, m^3/h)
101	$QPMAX1_1$	
102	$QPMAX1_2$	
103	$QPMAX1_3$	
104	$QPMAX2_0$	Max projected value of flow of flow input 2 (float, m^3/h)
105	$QPMAX2_1$	
106	$QPMAX2_2$	
107	$QPMAX2_3$	
108	$QPMAX3_0$	Max projected value of flow of flow input 3 (float, m^3/h)
109	$QPMAX3_1$	
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	$QPMAX4_3$	
116	$QPMIN1_0$	Min projected value of flow of flow input 1 (float, m^3/h)

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 ^0C)	
133	$KTEMP_1$		
134	$(T1\text{-}T2)min_0$	Min temperature difference T1-T2 (integer, 0,01 ^0C)	
135	$(T1\text{-}T2)min_1$		
136	$(T3\text{-}T4)min_0$	Min temperature difference T3-T4 (integer, 0,01 ^0C)	
137	$(T3\text{-}T4)min_1$		
138	$(T1\text{-}T2)Pmin_0$	Min projekted temperature difference T1-T2 (integer, 0,01 ^0C)	
139	$(T1\text{-}T2)Pmin_1$		
140	$(T3\text{-}T4)Pmin_0$	Min projekted temperature difference T3-T4 (integer, 0,01 ^0C)	
141	$(T3\text{-}T4)Pmin_1$		
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 1st system (integer, 0,1 kPa)	
149	$SENT1_1$		
150	$SENT2_0$	Value of pressure for calculations for 2nd system (integer, 0,1 kPa)	
151	$SENT2_1$		
152	MBusAddr	M-Bus address	
153	UARTSpeed1	Boud rate of wire interface	Bits: 7 = 0 – None parity, 1 – Even parity; 6 5 4 3 2 1 0 = 0x00 – 300 bps; 0x01 – 600 bps; 0x02 – 1200 bps; 0x03 – 2400 bps; 0x04 – 4800 bps; 0x05 – 9600 bps; 0x06 – 19200 bps; 0x07 – 38400 bps
154	UARTSpeed2	Boud rate of optical interface	
155	DimUnits	Units of energy: 0x00 – MWh 0x01 – Gcal 0x02 - GJ	
156	PKALBA	Report printing language: 0x00 – English 0x01 – Russian 0x02 – Lithuanian	