Sontex Thermal Energy Flow Metering

M-Bus specification

Electronic
Heat Cost Allocator

565
566 Radio Sontex
868 wM-Bus

Issue:	Rev. 20160121
Document:	M-Bus Frames 565 566 868
Firmware:	V1.1.0

Manufacturer:

Sontex SA
2605 Sonceboz, Switzerland
Phone: +41 32 488 30 00
Fax: +41 32 488 30 01
Email: sontex@sontex.ch
Internet: www.sontex.ch

Revision:

Issue	Date	Author	Description
Rev. 20151105	05.11.2015	NU	First release
Rev. 20160121	21.01.2016	PB/NU	Add new fields

	Master		Slave
1	**Normalize** SND_NKE(A=primary address)	->	
		<-	**Acknowledge** CON_SCC
2	**Request for user data** REQ_UD2(C=7Bh, A=primary address)	->	
	If more records in next telegram then continue at step 3	<-	**Respond with user data** RSP_UD(rsp_x, more records in next telegram)
3	**Request for user data** REQ_UD2(C=5Bh, A=primary address)	->	
	If more records in next telegram then continue at step 2	<-	**Respond with user data** RSP_UD(rsp_x, more records in next telegram)

Keys

	Optional bytes presents if encryption enabled		
xx	Value LSByte first		
yy	Value MSByte first		
ch	ASCII character		
ar	Device access rights		
	00	Consumer	
	01	Installer	
	02	Reserved	
	03	Manufacturer	
at	Autoroll time duration [s]		
	00..FF	0..127s (0 = autoroll OFF) If static menu, all autoroll time duration must be "0"	
cm	Commissining mode		
	00	Long press button	
	01	After mount	
cl cl	Carrier sense threshold in dBm		
	-130..-2	All other values are forbiden	
cs	The value of Check Sum is calculated from arithmetical sum modulo 256 of each byte of the frame except the fields: Start, Length (if any), Check Sum and Stop.		
ee	Encryption enabled		
	00	Disabled	
	01	Enabled	
en	Physical unit coding of energy :		
	6E	Units for H.C.A. (dimensionless)	
fg fg	Detailled errors flags	**565/566/868**	
	bit0	Fraud switch closed	
	bit1	Measure error	
	bit2	†	
	bit3	†	
	bit4	†	
	bit5	Key too long closed	
	bit6	Temperature out of range	
	bit7	†	
	bit8	Application error unknow field C	
	bit9	Application error unknow field CI	
	bit10	Application error unknow record	
	bit11	Application error access right	
	bit12	Application error record size	
	bit13	Application error record value	
	bit14	Application error bad password	
	bit15	†	† Not used, zero by de
ft	wM-Bus frame type		
	00	OMS (short)	
	01	Walkby (long)	
hh hh hh	Radio activity calendar (hours)		
	bit0	0h00..0h59	
	bit1	1h00..1h59	
	bit2	2h00..2h59	
	bit3	3h00..3h59	
	bit4	4h00..4h59	
	bit5	5h00..5h59	
	bit6	6h00..6h59	
	bit7	7h00..7h59	
	bit8	8h00..8h59	
	bit9	9h00..9h59	
	bit10	10h00..10h59	
	bit11	11h00..11h59	
	bit12	12h00..12h59	
	bit13	13h00..13h59	
	bit14	14h00..14h59	
	bit15	15h00..15h59	
	bit16	16h00..16h59	
	bit17	17h00..17h59	
	bit18	18h00..18h59	
	bit19	19h00..19h59	
	bit20	20h00..20h59	
	bit21	21h00..21h59	
	bit22	22h00..22h59	
	bit23	23h00..23h59	
hr	LCD temperature resolution		
	00	0.1°C	
	01	0.01°C	
Le	Length of the M-Bus frame. The fields Start, Length, Check Sum and Stop (6 bytes) are not included in the calculation of the Length field. The Length field is repeated twice preceded and followed by the Start field 68h.		
Lw	Length of the wM-Bus frame. The fields L, C, M1, A1 (10 bytes) are not included in the calculation of the Length field.		
md	Mesured media		
	08	Heat cost allocator	
mm mm	Radio activity calendar (month's year)		
	bit0	†	
	bit1	January	
	bit2	February	
	bit3	March	
	bit4	April	
	bit5	May	
	bit6	June	
	bit7	July	
	bit8	August	
	bit9	September	
	bit10	October	
	bit11	November	
	bit12	December	
	bit13	†	
	bit14	†	
	bit15	†	
mo	More records in next telegram :		
	0F	no	

	1F	yes

mp Measurement principle

00	Reserved for future use
01	One sensor with start sensor
02	Two sensors

pm Radio activity calendar (part of month)

bit0	From 1st to 4th of month
bit1	From 5th to 8th of month
bit2	From 9th to 12th of month
bit3	From 13th to 16th of month
bit4	From 17th to 20th of month
bit5	From 21th to 24th of month
bit6	From 25th to 28th of month
bit7	From 29th to end of month

po Position LCD sequence

00	Lcd off
01	Device errors
02	Reserved
03	Reserved
04	Totalizer (*)
05	Totalizer stored at set day
06	Totalizer half monthly values (*)
07	Max. radiator temperature of month (*)
08	Ambient temperature
09	Radiator temperature
0A	Identification number
0B	Date (*)
0C	Time
0D	Check code
0E	Set day
0F	Date of last fraud (*)
10	Fraud duration
11	Fraud counter
12	Max. radiator temperature of current period (*)
13	Max. radiator temperature of previous period
14	Segment test (*)
15	Software version
16	Battery use duration
17	Commissioning date
18	Measurement principle
19	wM-Bus mode
1A	Cost (Cost per unit * totalizer)
FF	Reserved

(*) Menu with submenu

pp pp Parameters states

bit0	Remote radiator sensor plugged
bit1	Product scala enabled
bit3..2	Operating mode
00b	Normal
01b	Storage not mounted
10b	Storage mounted
11b	Installation
bit5..4	Measurement principle
00b	Reserved for future use
01b	One sensor with start sensor
10b	Two sensors
11b	†
bit7..6	Communication type
00b	None (565)
01b	Radian 433MHz (566)
10b	wM-Bus 868MHz (868)
bit8	HCA currently covered (if 2 sensors)
bit9	Suppress counting activate now
bit10	Radio encryption enabled
bit12..11	wM-Bus frame type
00b	OMS (short)
01b	Walkby (long)
bit13..15	*Reserved for future use*

ps Product scala

00	Disabled
01	Enabled

rt Auto-reset totalizer

00	Never
01	At set day

sc Suppression counting

00	Disabled
01	Enabled

ss Skip next set day

00	Don't skip
01	Skip

st Status

	565/566/868	***M-Bus standard***
bit1..0	Application	*Application*
00b	No error	*No error*
01b	†	*Application busy*
10b	†	*Any application error*
11b	†	*Reserved*
bit2	Power low	*Power low*
bit3	†	*Permanent error*
bit4	Temporary error (with measure or handling)	*Temporary error*
bit5	Measure error	*Manufacturer specific*
bit6	Handling error (fraud or key)	*Manufacturer specific*
bit7	†	*Manufacturer specific*

ww Radio activity calendar (days of the week)

bit0	†	
bit1	Monday	ISO8601
bit2	Tuesday	
bit3	Wednesday	
bit4	Thursday	
bit5	Friday	
bit6	Saturday	
bit7	Sunday	

† Not used.

Normalize SND_NKE (master to slave)

	Field	Frame bytes in hex	Byte	Coding		Comment
Start	Start	10	1			
	Control	40	1			Normalize, SND_NKE
	Address	xx	1			
End	**C**heck **S**um	3D	1			
	Stop	16	1			

Frame size: 5 bytes

Acknowledge CON_SCC (slave to master)

Field	Frame bytes in hex	Bytes	Coding		
	E5	1			Acknowledge

Frame size: 1 bytes

Request for user data REQ_UD2 (master to slave)

	Field	Frame bytes in hex	Bytes	Coding		
Start	Start	10	1			
	Control	7B|5B	1			Request for class 2 data, REQ_UD2
	Address	xx	1			
End	**C**heck **S**um	cs	1			
	Stop	16	1			

Frame size: 5 bytes

Application reset SND_UD (master to slave)

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment
Start	Start, **L**ength	68,Le Le,68	4			
	Control	73|53	1			Send user data to slave, SND_UD
	Address	xx	1			
User data	Control **I**nformation	50	1			Application reset
	Subcode	xx	1	C, 8 bits		Empty, 00h, 01h : rsp_1_rsp_2 80h: rsp_conf_1 _conf_2 60h: rsp_monthly_1_2_3
End	**C**heck **S**um	cs	1			
	Stop	16	1			

Max frame size: 10 bytes

Stuctured write SND_UD (master to slave)

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	From FW	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function‡	Origin
Start	Start, Length	68,Le Le,68	4										
	Control	73|53	1			Send user data to slave, SND_UD							
	Address	xx	1										
User data	Control Information	51	1			Stuctured write telegram							
	Current date & time	04,6D,xx xx xx xx	6	F, 32 bits			1.0.2	DateAndTime	0	0	0	0	Records
	Enter the installer password	0C,FD 13,xx xx xx xx	7	A, 32 bits			1.0.2	AccessCodeOperator	0	0	0	0	
	Intentional loss of all access rights	0C,FD 13,FF FF FF FF	7	A, 32 bits			1.0.2	AccessCodeOperator	0	0	0	0	
	Change the installer password	4C,FD 13,xx xx xx xx	7	A, 32 bits		Note 2	1.0.2	AccessCodeOperator	0	0	1	0	
	Disable the installer password	4C,FD 13,00 00 00 00	7	A, 32 bits		Note 2	1.0.2	AccessCodeOperator	0	0	1	0	
	Identification number	0C,79,xx xx xx xx	6	A, 32 bits		Note 2	1.0.2	IdentificationNumber	0	0	0	0	
	Set day	42,6C,xx xx	4	G, 16 bits		Note 2	1.0.2	Date	0	0	1	0	
	Totalizer of heating	03,6E,xx xx xx	5	B, 24 bits		dimensionless Note 2, 5	1.0.2	HeatCostAllocator	0	0	0	0	
	Totalizer of heating remainder	05,FF 01,xx xx xx xx	7	H, 32 bits		§ Note 2, 5	1.0.2	EnergyRemainder	0	0	0	0	
	Totalizer stored at set day	43,6E,xx xx xx	5	B, 24 bits		Note 2	1.0.2	HeatCostAllocator	0	0	1	0	
	Radiator maximum temperature of previous period	52,59,xx xx	4	B, 16 bits		[1/100 °C] Note 2	1.0.2	FlowTemperature	0	0	1	1	
	Initialize all monthly values of totalizer at 1st	83 0F,6E,xx xx xx	6	B, 24 bits		dimensionless Note 2, 5	1.0.2	HeatCostAllocator	0	0	30	0	
	Initialize all monthly values of totalizer at 16th	83 05,6E,xx xx xx	6	B, 24 bits		dimensionless Note 2, 5	1.0.2	HeatCostAllocator	0	0	10	0	
	Initialize all monthly radiator maximum temperature	92 88 01,59,xx xx	6	B, 16 bits		[1/100 °C] Note 2, 5	1.0.2	FlowTemperature	0	0	48	1	
	Initialize all half monthly ambient average temperature	82 8D 07,65,xx xx	6	B, 16 bits		[1/100 °C] Note 2, 5	1.1.0	ExternalTemperature	0	0	250	0	
	Units factor kC	05,FF 2D,xx xx xx xx	7	H, 32 bits		§ Note 2	1.0.2	Coefficient	0	0	0	0	
	Units factor kQ	85 20,FF 2D,xx xx xx xx	8	H, 32 bits		§ Note 2	1.0.2	Coefficient	0	2	0	0	
	Radiator maximum temperature of current period	12,59,xx xx	4	B, 16 bits		[1/100 °C] Note 2, 5	1.0.2	FlowTemperature	0	0	0	1	
	Radiator maximum temperature of month	D2 02,59,xx xx	5	B, 16 bits		[1/100 °C] Note 2, 5	1.0.2	FlowTemperature	0	0	5	1	
	Fraud duration	83 10,FD 31,xx xx xx	7	B, 24 bits		[min] Note 2, 5	1.0.2	DurationOfTariff	0	1	0	0	
	Date of the last fraud	82 10,6C,xx xx	5	G, 16 bits		Note 2, 5	1.0.2	Date	0	1	0	0	
	Commissioning mode	01,FF FF 1D,cm	5	C, 8 bits		§ Note 2	1.0.2	CommissioningMode	0	0	0	0	
	Fraud counter	81 10,FD 61,xx	5	C, 8 bits		Note 2, 5	1.0.2	CumulationCounter	0	1	0	0	
	Start date of period (winter)	82 30,6C,xx xx	5	G, 16 bits		Note 2	1.0.2	Date	0	3	0	0	
	Start radiator temperature (winter)	85 30,5B,xx xx xx xx	7	H, 32 bits		Note 2	1.0.2	FlowTemperature	0	3	0	0	
	Max ambient temperature (winter)	95 30,67,xx xx xx xx	7	H, 32 bits		Note 2	1.0.2	ExternalTemperature	0	3	0	1	
	Min delta temperature (winter)	A5 30,63,xx xx xx xx	7	H, 32 bits		Note 2	1.0.2	TemperatureDifference	0	3	0	2	
	Default ambient temperature (winter)	85 30,67,xx xx xx xx	7	H, 32 bits		Note 2	1.0.2	ExternalTemperature	0	3	0	0	
	Measure period (winter)	81 30,FF FF 1F,xx	6	C, 8 bits		[min] § Note 2	1.0.2	MeasurePeriod	0	3	0	0	
	Start date of period (summer)	82 80 10,6C,xx xx	6	G, 16 bits		Note 2	1.0.2	Date	0	4	0	0	
	Suppression of counting (summer)	81 80 10,FF FF 1E,sc	7	C, 8 bits		§ Note 2	1.0.2	SuppressCounting	0	4	0	0	
	Start radiator temperature (summer)	85 80 10,5B,xx xx xx xx	8	H, 32 bits		Note 2	1.0.2	FlowTemperature	0	4	0	0	
	Max ambient temperature (summer)	95 80 10,67,xx xx xx xx	8	H, 32 bits		Note 2	1.0.2	ExternalTemperature	0	4	0	1	
	Min delta temperature (summer)	A5 80 10,63,xx xx xx xx	8	H, 32 bits		Note 2	1.0.2	TemperatureDifference	0	4	0	2	
	Default ambient temperature (summer)	85 80 10,67,xx xx xx xx	8	H, 32 bits		Note 2	1.0.2	ExternalTemperature	0	4	0	0	
	Measure period (summer)	81 80 10,FF FF 1F,xx	7	C, 8 bits		[min] § Note 2	1.0.2	MeasurePeriod	0	4	0	0	
	Measurement principle	01,FF FF 20,mp	5	C, 8 bits		§ Note 2	1.0.2	MeasurementPrinciple	0	0	0	0	
	Product scale enabled	01,FF FF 21,ps	5	C, 8 bits		§ Note 2	1.0.2	ProductScala	0	0	0	0	
	LCD sequence	0D,FD 76,20 po at po at po at po at po at po at po at po at po at po at po at po at po at po at po at po at po at po at	36	LVAR		Note 2	1.0.2	DataContainerForManufacturerProtocol	0	0	0	0	
	LCD temperature high resolution	01,FF FF 22,hr	5	C, 8 bits		§ Note 2	1.0.2	HighResolutionDisplay	0	0	0	0	
	Change the AES128 encryption key	0D,FD 19,F0,xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	20	LVAR		Note 2	1.0.2	SecurityKey	0	0	0	0	
	wM-Bus frame type	01,FF 41,ft	4	C, 8 bits		§ Note 2	1.0.2	DeviceSpecificValue1	0	0	0	0	
	Radio activity calendar	8D 20,FD 76,E7 hh hh hh ww mm mm pm	12	LVAR		Note 2	1.0.2	DataContainerForManufacturerProtocol	0	2	0	0	
	RF transmission interval	01,FD 3D,xx	4	C, 8 bits		[min] Note 2	1.0.2	PeriodOfNominalDataTransmissions	0	0	0	0	
	Limit of battery use duration for low battery flag	13,22,xx xx xx	5	C, 24 bits		[h] Note 2	1.0.2	OnTime	0	0	0	1	
	Encryption enabled	01,FF FF 39,ee	5	C, 8 bits		§ Note 2	1.0.2	EncryptionEnabled	0	0	0	0	
	Force normal mode	01,FF 24,AC	4	C, 8 bits		§ Note 2	1.0.2	StartProcess	0	0	0	0	
	Force storage mode	01,FF 24,AD	4	C, 8 bits		§ Note 2	1.0.2	StartProcess	0	0	0	0	
	Auto-reset totalizer	01,FF FF 23,rt	5	C, 8 bits		§ Note 2	1.0.2	AutoResetTotalizer	0	0	0	0	
	Skip next set day	01,FF 40,ss	4	C, 8 bits		§ Note 2 0: don't skip; 1: skip the next set day	1.0.2	DeviceSpecificValue0	0	0	0	0	
	Cost per unit totalized	05,FD 87 28,xx xx xx	8	H, 32 bits		[€ / unit] Note 2, 6	1.1.0	Debit_PerInputPulseOnChannel0	0	0	0	0	
	Carrier sense threshold	02,FF 43,cl cl	5	B, 16 bits		[dBm] § Note 2	1.1.0	DeviceSpecificValue3	0	0	0	0	
End	Check Sum	cs	1										
	Stop	16	1										

Frame size: 366 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.
2. The installer access right (or higher) is needed to change this value
4. The manufacturer access right (or higher) is needed to change this value
5. Initialized automaticaly after the commissioning
6. If the value <> 0, a LCD subposition of totalizer is automatically added with the "Cost per unit" * "Totalizer"

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function‡	Origin
START	Start, Length	68,Le Le,68	4									
	Control	08	1			Respond with user data, RSP_UD						
	Address	xx	1									
USER DATA	Control Information	72	1			Variable structure respond						
	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
	Access number	xx	1	C, 8 bits			AccessNumber					
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
	Current date & time	04,6D,xx xx xx xx	6	F, 32 bits			DateAndTime	0	0	0	0	Records
	Totalizer of heating	03,6E,xx xx xx	5	B, 24 bits		dimensionless	HeatCostAllocator	0	0	0	0	
	Set day	42,6C,xx xx	4	G, 16 bits			Date	0	0	1	0	
	Totalizer stored at set day	43,6E,xx xx xx	5	B, 24 bits			HeatCostAllocator	0	0	1	0	
	Radiator maximum temperature of previous period	52,59,xx xx	4	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	1	1	
	Date stored at month - 18	82 88 01,6C,x1 xx	6	G, 16 bits			Date	0	0	48	0	
	Units stored at month - 18	83 88 01,6E,xx xx xx	7	B, 24 bits		dimensionless	HeatCostAllocator	0	0	48	0	
	Units compact profile	8D 88 01,EE 1E,35,33 FE	8	LVAR			HeatCostAllocator_CompactProfileWithRegisters	0	0	48	0	
	Units stored at month - 17	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	49	0	
	Units stored at month - 16	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	50	0	
	Units stored at month - 15	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	51	0	
	Units stored at month - 14	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	52	0	
	Units stored at month - 13	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	53	0	
	Units stored at month - 12	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	54	0	
	Units stored at month - 11	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	55	0	
	Units stored at month - 10	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	56	0	
	Units stored at month - 9	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	57	0	
	Units stored at month - 8	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	58	0	
	Units stored at month - 7	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	59	0	
	Units stored at month - 6	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	60	0	
	Units stored at month - 5	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	61	0	
	Units stored at month - 4	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	62	0	
	Units stored at month - 3	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	63	0	
	Units stored at month - 2	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	64	0	
	Units stored at month - 1	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	65	0	
	Units factor kC	05,FF 2D,xx xx xx xx	7	H, 32 bits		§ dimensionless value	Coefficient	0	0	0	0	
	Units factor kQ	85 20,FF 2D,xx xx xx xx	8	H, 32 bits		§ dimensionless value	Coefficient	0	2	0	0	
	Radiator temperature	02,59,xx xx	4	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	0	0	
	Ambient temperature	02,65,xx xx	4	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	0	0	
	Radiator maximum temperature of current period	12,59,xx xx	4	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	0	1	
	Fraud duration	83 10,FD 31,xx xx xx	7	B, 24 bits		[min]	DurationOfTariff	0	1	0	0	
	Date of the last fraud	82 10,6C,xx xx	5	G, 16 bits			Date	0	1	0	0	
	Commissioning date	82 20,6C,xx xx	5	G, 16 bits			Date	0	2	0	0	
	Internal version	0B,FD 0F,xx xx xx	6	A, 24 bits			OtherSoftwareVersion	0	0	0	0	
	Flags error	02,FF 2C,fg fg	5	D, 16 bits		§	ManufacturerErrorFlags	0	0	0	0	
	State of parameters	02,FD 66,pp pp	5	D, 16 bits			StateOfParameterActivation	0	0	0	0	
	Device access right	01,FF 2B,ar	4	D, 8 bits		§	DeviceAccessRightLevel	0	0	0	0	
	Fabrication Number	0C,78,xx xx xx xx	6	A, 32 bits			FabricationNumber	0	0	0	0	
END	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
	Check **S**um	cs	1									
	Stop	16	1									

Max frame size: 188 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function‡	Origin
START	Start, Length	68,Le Le,68	4									
	Control	08	1			Respond with user data, RSP_UD						
	Address	xx	1									
USER DATA	Control Information	72	1			Variable structure respond						
	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
	Access number	xx	1	C, 8 bits			AccessNumber					
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
	Fraud counter	81 10,FD 61,xx	5	C, 8 bits			CumulationCounter	0	1	0	0	Records
	Date stored at month - 36	82 0F,6C,x1 xx	5	G, 16 bits			Date	0	0	30	0	
	Units stored at month - 36	83 0F,6E,xx xx xx	6	B, 24 bits		dimensionless	HeatCostAllocator	0	0	30	0	
	Units compact profile	8D 0F,EE 1E,35,33 FE	7	LVAR			HeatCostAllocator_CompactProfileWithRegisters	0	0	30	0	
	Units stored at month - 35	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	31	0	
	Units stored at month - 34	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	32	0	
	Units stored at month - 33	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	33	0	
	Units stored at month - 32	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	34	0	
	Units stored at month - 31	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	35	0	
	Units stored at month - 30	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	36	0	
	Units stored at month - 29	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	37	0	
	Units stored at month - 28	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	38	0	
	Units stored at month - 27	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	39	0	
	Units stored at month - 26	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	40	0	
	Units stored at month - 25	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	41	0	
	Units stored at month - 24	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	42	0	
	Units stored at month - 23	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	43	0	
	Units stored at month - 22	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	44	0	
	Units stored at month - 21	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	45	0	
	Units stored at month - 20	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	46	0	
	Units stored at month - 19	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	47	0	
	Date stored at 16th of month - 18	82 05,6C,xx xx	5	G, 16 bits			Date	0	0	10	0	
	Units stored at 16th of month - 18	83 05,6E,xx xx xx	6	B, 24 bits		dimensionless	HeatCostAllocator	0	0	10	0	
	Units compact profile	8D 05,EE 1E,35,33 FE	7	LVAR			HeatCostAllocator_CompactProfileWithRegisters	0	0	10	0	
	Units stored at 16th of month - 17	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	11	0	
	Units stored at 16th of month - 16	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	12	0	
	Units stored at 16th of month - 15	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	13	0	
	Units stored at 16th of month - 14	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	14	0	
	Units stored at 16th of month - 13	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	15	0	
	Units stored at 16th of month - 12	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	16	0	
	Units stored at 16th of month - 11	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	17	0	
	Units stored at 16th of month - 10	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	18	0	
	Units stored at 16th of month - 9	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	19	0	
	Units stored at 16th of month - 8	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	20	0	
	Units stored at 16th of month - 7	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	21	0	
	Units stored at 16th of month - 6	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	22	0	
	Units stored at 16th of month - 5	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	23	0	
	Units stored at 16th of month - 4	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	24	0	
	Units stored at 16th of month - 3	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	25	0	
	Units stored at 16th of month - 2	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	26	0	
	Units stored at 16th of month - 1	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	27	0	
	Date stored at month - 18	82 88 01,6C,x1 xx	6	G, 16 bits			Date	0	0	48	0	
	Radiator max temp stored at month - 18	92 88 01,59,xx xx	6	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	48	1	
	Radiator max temp compact profile	9D 88 01,D9 1E,24,32 FE	8	LVAR			FlowTemperature_CompactProfileWithRegisters	0	0	48	1	
	Radiator max temp stored at month - 17	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	49	1	
	Radiator max temp stored at month - 16	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	50	1	
	Radiator max temp stored at month - 15	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	51	1	
	Radiator max temp stored at month - 14	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	52	1	
	Radiator max temp stored at month - 13	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	53	1	
	Radiator max temp stored at month - 12	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	54	1	
	Radiator max temp stored at month - 11	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	55	1	
	Radiator max temp stored at month - 10	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	56	1	
	Radiator max temp stored at month - 9	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	57	1	
	Radiator max temp stored at month - 8	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	58	1	
	Radiator max temp stored at month - 7	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	59	1	
	Radiator max temp stored at month - 6	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	60	1	
	Radiator max temp stored at month - 5	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	61	1	
	Radiator max temp stored at month - 4	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	62	1	
	Radiator max temp stored at month - 3	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	63	1	
	Radiator max temp stored at month - 2	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	64	1	
	Radiator max temp stored at month - 1	xx xx	2	B, 16 bits		[1/100 °C]	FlowTemperature	0	0	65	1	
END	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
	Check Sum	cs	1									
	Stop	16	1									

Max frame size: 219 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function	Origin
START	Start, Length	68,Le Le,68	4									
	Control	08	1			Respond with user data, RSP_UD						
	Address	xx	1									
USER DATA	Control Information	72	1			Variable structure respond						
	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
	Access number	xx	1	C, 8 bits			AccessNumber					
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
	Date stored at month - 36	82 8D 07,6C,x1 xx	6	G, 16 bits			Date	0	0	250	0	Records
	Ambient average temp stored at half month - 36	82 8D 07,65,xx xx	6	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	250	0	
	Ambient average temp compact profile	8D 8D 07,E5 1E,48,32 FD	8	LVAR			ExternalTemperature_CompactProfileWithRegis	0	0	250	0	
	Ambient average temp stored at half month - 35	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	251	0	
	Ambient average temp stored at half month - 34	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	252	0	
	Ambient average temp stored at half month - 33	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	253	0	
	Ambient average temp stored at half month - 32	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	254	0	
	Ambient average temp stored at half month - 31	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	255	0	
	Ambient average temp stored at half month - 30	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	256	0	
	Ambient average temp stored at half month - 29	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	257	0	
	Ambient average temp stored at half month - 28	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	258	0	
	Ambient average temp stored at half month - 27	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	259	0	
	Ambient average temp stored at half month - 26	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	260	0	
	Ambient average temp stored at half month - 25	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	261	0	
	Ambient average temp stored at half month - 24	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	262	0	
	Ambient average temp stored at half month - 23	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	263	0	
	Ambient average temp stored at half month - 22	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	264	0	
	Ambient average temp stored at half month - 21	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	265	0	
	Ambient average temp stored at half month - 20	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	266	0	
	Ambient average temp stored at half month - 19	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	267	0	
	Ambient average temp stored at half month - 18	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	268	0	
	Ambient average temp stored at half month - 17	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	269	0	
	Ambient average temp stored at half month - 16	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	270	0	
	Ambient average temp stored at half month - 15	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	271	0	
	Ambient average temp stored at half month - 14	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	272	0	
	Ambient average temp stored at half month - 13	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	273	0	
	Ambient average temp stored at half month - 12	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	274	0	
	Ambient average temp stored at half month - 11	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	275	0	
	Ambient average temp stored at half month - 10	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	276	0	
	Ambient average temp stored at half month - 9	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	277	0	
	Ambient average temp stored at half month - 8	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	278	0	
	Ambient average temp stored at half month - 7	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	279	0	
	Ambient average temp stored at half month - 6	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	280	0	
	Ambient average temp stored at half month - 5	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	281	0	
	Ambient average temp stored at half month - 4	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	282	0	
	Ambient average temp stored at half month - 3	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	283	0	
	Ambient average temp stored at half month - 2	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	284	0	
	Ambient average temp stored at half month - 1	xx xx	2	B, 16 bits		[1/100 °C]	ExternalTemperature	0	0	285	0	
	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
END	Check Sum	cs	1									
	Stop	16	1									

Max frame size: 112 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function‡	Origin
START	Start, Length	68,Le Le,68	4									
	Control	08	1			Respond with user data, RSP_UD						
	Address	xx	1									
USER DATA	Control Information	72	1			Variable structure respond						
	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
	Access number	xx	1	C, 8 bits			AccessNumber					
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
	Date stored at month - 48	82 82 06,6C,x1 xx	6	G, 16 bits			Date	0	0	196	0	Records
	Units stored at month - 48	83 82 06,6E,xx xx xx	7	B, 24 bits		dimensionless	HeatCostAllocator	0	0	196	0	
	Units compact profile	8D 82 06,EE 1E,8F,33 FE	8	LVAR		dimensionless	HeatCostAllocator_CompactProfileWithRegisters	0	0	196	0	
	Units stored at month - 47	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	197	0	
	Units stored at month - 46	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	198	0	
	Units stored at month - 45	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	199	0	
	Units stored at month - 44	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	200	0	
	Units stored at month - 43	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	201	0	
	Units stored at month - 42	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	202	0	
	Units stored at month - 41	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	203	0	
	Units stored at month - 40	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	204	0	
	Units stored at month - 39	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	205	0	
	Units stored at month - 38	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	206	0	
	Units stored at month - 37	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	207	0	
	Units stored at month - 36	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	208	0	
	Units stored at month - 35	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	209	0	
	Units stored at month - 34	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	210	0	
	Units stored at month - 33	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	211	0	
	Units stored at month - 32	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	212	0	
	Units stored at month - 31	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	213	0	
	Units stored at month - 30	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	214	0	
	Units stored at month - 29	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	215	0	
	Units stored at month - 28	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	216	0	
	Units stored at month - 27	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	217	0	
	Units stored at month - 26	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	218	0	
	Units stored at month - 25	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	219	0	
	Units stored at month - 24	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	220	0	
	Units stored at month - 23	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	221	0	
	Units stored at month - 22	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	222	0	
	Units stored at month - 21	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	223	0	
	Units stored at month - 20	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	224	0	
	Units stored at month - 19	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	225	0	
	Units stored at month - 18	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	226	0	
	Units stored at month - 17	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	227	0	
	Units stored at month - 16	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	228	0	
	Units stored at month - 15	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	229	0	
	Units stored at month - 14	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	230	0	
	Units stored at month - 13	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	231	0	
	Units stored at month - 12	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	232	0	
	Units stored at month - 11	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	233	0	
	Units stored at month - 10	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	234	0	
	Units stored at month - 9	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	235	0	
	Units stored at month - 8	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	236	0	
	Units stored at month - 7	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	237	0	
	Units stored at month - 6	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	238	0	
	Units stored at month - 5	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	239	0	
	Units stored at month - 4	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	240	0	
	Units stored at month - 3	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	241	0	
	Units stored at month - 2	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	242	0	
	Units stored at month - 1	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	243	0	
	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
END	Check Sum	cs	1									
	Stop	16	1									

Max frame size: 184 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function‡	Origin
START	Start, Length	68,Le Le,68	4									
START	Control	08	1			Respond with user data, RSP_UD						
START	Address	xx	1									
	Control Information	72	1			Variable structure respond						
	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					Header
	Version of meter	16	1	C, 8 bits			Version					Header
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					Header
	Access number	xx	1	C, 8 bits			AccessNumber					Header
	Status	st	1	Ds, 8 bits			Status					Header
	Config word	00 00	2	C, 16 bits			Signature					Header
USER DATA	Date stored at month - 96	82 8A 04,6C,x1 xx	6	G, 16 bits			Date	0	0	148	0	Records
USER DATA	Units stored at month - 96	83 8A 04,6E,xx xx xx	7	B, 24 bits		dimensionless	HeatCostAllocator	0	0	148	0	Records
USER DATA	Units compact profile	8D 8A 04,EE 1E,8F,33 FE	8	LVAR		dimensionless	HeatCostAllocator_CompactProfileWithRegisters	0	0	148	0	Records
USER DATA	Units stored at month - 95	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	149	0	Records
USER DATA	Units stored at month - 94	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	150	0	Records
USER DATA	Units stored at month - 93	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	151	0	Records
USER DATA	Units stored at month - 92	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	152	0	Records
USER DATA	Units stored at month - 91	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	153	0	Records
USER DATA	Units stored at month - 90	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	154	0	Records
USER DATA	Units stored at month - 89	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	155	0	Records
USER DATA	Units stored at month - 88	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	156	0	Records
USER DATA	Units stored at month - 87	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	157	0	Records
USER DATA	Units stored at month - 86	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	158	0	Records
USER DATA	Units stored at month - 85	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	159	0	Records
USER DATA	Units stored at month - 84	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	160	0	Records
USER DATA	Units stored at month - 83	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	161	0	Records
USER DATA	Units stored at month - 82	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	162	0	Records
USER DATA	Units stored at month - 81	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	163	0	Records
USER DATA	Units stored at month - 80	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	164	0	Records
USER DATA	Units stored at month - 79	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	165	0	Records
USER DATA	Units stored at month - 78	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	166	0	Records
USER DATA	Units stored at month - 77	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	167	0	Records
USER DATA	Units stored at month - 76	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	168	0	Records
USER DATA	Units stored at month - 75	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	169	0	Records
USER DATA	Units stored at month - 74	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	170	0	Records
USER DATA	Units stored at month - 73	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	171	0	Records
USER DATA	Units stored at month - 72	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	172	0	Records
USER DATA	Units stored at month - 71	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	173	0	Records
USER DATA	Units stored at month - 70	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	174	0	Records
USER DATA	Units stored at month - 69	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	175	0	Records
USER DATA	Units stored at month - 68	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	176	0	Records
USER DATA	Units stored at month - 67	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	177	0	Records
USER DATA	Units stored at month - 66	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	178	0	Records
USER DATA	Units stored at month - 65	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	179	0	Records
USER DATA	Units stored at month - 64	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	180	0	Records
USER DATA	Units stored at month - 63	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	181	0	Records
USER DATA	Units stored at month - 62	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	182	0	Records
USER DATA	Units stored at month - 61	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	183	0	Records
USER DATA	Units stored at month - 60	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	184	0	Records
USER DATA	Units stored at month - 59	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	185	0	Records
USER DATA	Units stored at month - 58	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	186	0	Records
USER DATA	Units stored at month - 57	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	187	0	Records
USER DATA	Units stored at month - 56	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	188	0	Records
USER DATA	Units stored at month - 55	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	189	0	Records
USER DATA	Units stored at month - 54	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	190	0	Records
USER DATA	Units stored at month - 53	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	191	0	Records
USER DATA	Units stored at month - 52	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	192	0	Records
USER DATA	Units stored at month - 51	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	193	0	Records
USER DATA	Units stored at month - 50	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	194	0	Records
USER DATA	Units stored at month - 49	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	195	0	Records
END	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
END	Check Sum	cs	1									
END	Stop	16	1									

Max frame size: 184 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function‡	Origin
START	Start, Length	68,Le Le,68	4									
	Control	08	1			Respond with user data, RSP_UD						
	Address	xx	1									
	Control Information	72	1			Variable structure respond						
	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
	Access number	xx	1	C, 8 bits			AccessNumber					
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
USER DATA	Date stored at month - 144	82 82 03,6C,x1 xx	6	G, 16 bits			Date	0	0	100	0	Records
	Units stored at month - 144	83 82 03,6E,xx xx xx	7	B, 24 bits		dimensionless	HeatCostAllocator	0	0	100	0	
	Units compact profile	8D 82 03,EE 1E,8F,33 FE	8	LVAR		dimensionless	HeatCostAllocator_CompactProfileWithRegisters	0	0	100	0	
	Units stored at month - 143	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	101	0	
	Units stored at month - 142	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	102	0	
	Units stored at month - 141	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	103	0	
	Units stored at month - 140	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	104	0	
	Units stored at month - 139	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	105	0	
	Units stored at month - 138	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	106	0	
	Units stored at month - 137	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	107	0	
	Units stored at month - 136	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	108	0	
	Units stored at month - 135	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	109	0	
	Units stored at month - 134	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	110	0	
	Units stored at month - 133	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	111	0	
	Units stored at month - 132	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	112	0	
	Units stored at month - 131	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	113	0	
	Units stored at month - 130	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	114	0	
	Units stored at month - 129	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	115	0	
	Units stored at month - 128	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	116	0	
	Units stored at month - 127	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	117	0	
	Units stored at month - 126	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	118	0	
	Units stored at month - 125	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	119	0	
	Units stored at month - 124	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	120	0	
	Units stored at month - 123	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	121	0	
	Units stored at month - 122	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	122	0	
	Units stored at month - 121	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	123	0	
	Units stored at month - 120	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	124	0	
	Units stored at month - 119	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	125	0	
	Units stored at month - 118	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	126	0	
	Units stored at month - 117	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	127	0	
	Units stored at month - 116	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	128	0	
	Units stored at month - 115	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	129	0	
	Units stored at month - 114	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	130	0	
	Units stored at month - 113	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	131	0	
	Units stored at month - 112	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	132	0	
	Units stored at month - 111	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	133	0	
	Units stored at month - 110	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	134	0	
	Units stored at month - 109	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	135	0	
	Units stored at month - 108	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	136	0	
	Units stored at month - 107	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	137	0	
	Units stored at month - 106	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	138	0	
	Units stored at month - 105	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	139	0	
	Units stored at month - 104	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	140	0	
	Units stored at month - 103	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	141	0	
	Units stored at month - 102	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	142	0	
	Units stored at month - 101	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	143	0	
	Units stored at month - 100	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	144	0	
	Units stored at month - 99	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	145	0	
	Units stored at month - 98	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	146	0	
	Units stored at month - 97	xx xx xx	3	B, 24 bits		dimensionless	HeatCostAllocator	0	0	147	0	
	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
END	Check Sum	cs	1									
	Stop	16	1									

Max frame size: 184 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Functionf	Origin
START	Start, Length	68,Le Le,68	4									
	Control	08	1			Respond with user data, RSP_UD						
	Address	xx	1									
USER DATA	Control Information	72	1			Variable structure respond						
	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
	Access number	xx	1	C, 8 bits			AccessNumber					
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
	AES verification	2F 2F	2		🔒	Encryption verification	IdleFiller					
	Current date & time	04,6D,xx xx xx xx	6	F, 32 bits	🔒		DateAndTime	0	0	0	0	Records
	Totalizer of heating	03,6E,xx xx xx	5	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	0	0	
	Set day	42,6C,xx xx	4	G, 16 bits	🔒		Date	0	0	1	0	
	Totalizer stored at set day	43,6E,xx xx xx	5	B, 24 bits	🔒		HeatCostAllocator	0	0	1	0	
	Radiator maximum temperature of previous period	52,59,xx xx	4	B, 16 bits	🔒	[1/100 °C]	FlowTemperature	0	0	1	1	
	Date stored at month - 18	82 88 01,6C,x1 xx	6	G, 16 bits	🔒		Date	0	0	48	0	
	Units stored at month - 18	83 88 01,6E,xx xx xx	7	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	48	0	
	Units compact profile	8D 88 01,EE 1E,35,33 FE	8	LVAR	🔒		HeatCostAllocator_CompactProfileWithRegisters	0	0	48	0	
	Units stored at month - 17	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	49	0	
	Units stored at month - 16	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	50	0	
	Units stored at month - 15	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	51	0	
	Units stored at month - 14	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	52	0	
	Units stored at month - 13	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	53	0	
	Units stored at month - 12	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	54	0	
	Units stored at month - 11	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	55	0	
	Units stored at month - 10	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	56	0	
	Units stored at month - 9	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	57	0	
	Units stored at month - 8	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	58	0	
	Units stored at month - 7	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	59	0	
	Units stored at month - 6	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	60	0	
	Units stored at month - 5	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	61	0	
	Units stored at month - 4	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	62	0	
	Units stored at month - 3	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	63	0	
	Units stored at month - 2	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	64	0	
	Units stored at month - 1	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	65	0	
	Units factor kC	05,FF 2D,xx xx xx xx	7	H, 32 bits	🔒	§ dimensionless value	Coefficient	0	0	0	0	
	Units factor kQ	85 20,FF 2D,xx xx xx xx	8	H, 32 bits	🔒	§ dimensionless value	Coefficient	0	2	0	0	
	Radiator temperature	02,59,xx xx	4	B, 16 bits	🔒	[1/100 °C]	FlowTemperature	0	0	0	0	
	Ambient temperature	02,65,xx xx	4	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	0	0	
	Radiator maximum temperature of current period	12,59,xx xx	4	B, 16 bits	🔒	[1/100 °C]	FlowTemperature	0	0	0	1	
	Fraud duration	83 10,FD 31,xx xx xx	7	B, 24 bits	🔒	[min]	DurationOfTariff	0	1	0	0	
	Date of the last fraud	82 10,6C,xx xx	5	G, 16 bits	🔒		Date	0	1	0	0	
	Commissioning date	82 20,6C,xx xx	5	G, 16 bits	🔒		Date	0	2	0	0	
	Internal version	0B,FD 0F,xx xx xx	6	A, 24 bits	🔒		OtherSoftwareVersion	0	0	0	0	
	Flags error	02,FF 2C,fg fg	5	D, 16 bits	🔒	§	ManufacturerErrorFlags	0	0	0	0	
	State of parameters	02,FD 66,pp pp	5	D, 16 bits	🔒		StateOfParameterActivation	0	0	0	0	
	Fill AES	2F 2F	2		🔒		IdleFiller					
	Device access right	01,FF 2B,ar	4	D, 8 bits		§	DeviceAccessRightLevel	0	0	0	0	Record
	Fabrication Number	0C,78,xx xx xx xx	6	A, 32 bits			FabricationNumber	0	0	0	0	
	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
END	Check Sum	cs	1									
	Stop	16	1									

Max frame size: 192 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

RSP_UD

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	Function‡	Origin
START	Start, Length	68,Le Le,68	4									
START	Control	08	1			Respond with user data, RSP_UD						
START	Address	xx	1									
USER DATA	Control Information	72	1			Variable structure respond						
USER DATA	Identification number	xx xx xx xx	4	A, 32 bits			IdentificationNumber					Header
USER DATA	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					Header
USER DATA	Version of meter	16	1	C, 8 bits			Version					Header
USER DATA	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					Header
USER DATA	Access number	xx	1	C, 8 bits			AccessNumber					Header
USER DATA	Status	st	1	Ds, 8 bits			Status					Header
USER DATA	Config word	00 00	2	C, 16 bits			Signature					Header
USER DATA	AES verification	2F 2F	2		🔒	Encryption verification	IdleFiller					
USER DATA	Fraud counter	81 10,FD 61,xx	5	C, 8 bits	🔒		CumulationCounter	0	1	0	0	Records
USER DATA	Cost per unit totalized	05,FD 87 28,xx xx xx xx	8	H, 32 bits	🔒	[€ / unit]	Debit_PerInputPulseOnChannel0	0	0	0	0	Records
USER DATA	Auto-reset totaliser	01,FF FF 23,rt	5	C, 8 bits	🔒	§	AutoResetTotalizer	0	0	0	0	Records
USER DATA	Radio scan counter	84 A0 20,FD 61,xx xx xx xx	9	C, 32 bits	🔒		CumulationCounter	0	10	0	0	Records
USER DATA	Radio carrier counter	84 B0 20,FD 61,xx xx xx xx	9	C, 32 bits	🔒		CumulationCounter	0	11	0	0	Records
USER DATA	Radio wakeup counter	84 80 30,FD 61,xx xx xx xx	9	C, 32 bits	🔒		CumulationCounter	0	12	0	0	Records
USER DATA	Radio received frames counter	84 90 30,FD 61,xx xx xx xx	9	C, 32 bits	🔒		CumulationCounter	0	13	0	0	Records
USER DATA	Radio sent frames counter	84 A0 30,FD 61,xx xx xx xx	9	C, 32 bits	🔒		CumulationCounter	0	14	0	0	Records
USER DATA	Carrier sense threshold	02,FF 43,cl cl	5	B, 16 bits	🔒	[dBm]§	DeviceSpecificValue3	0	0	0	0	Records
USER DATA	Date stored at month - 36	82 8D 07,6C,x1 xx	6	G, 16 bits	🔒		Date	0	0	250	0	Records
USER DATA	Ambient average temp stored at half month - 36	82 8D 07,65,xx xx	6	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	250	0	Records
USER DATA	Ambient average temp compact profile	8D 8D 07,E5 1E,48,32 FD	8	LVAR	🔒		ExternalTemperature_CompactProfileWithRegist	0	0	250	0	Records
USER DATA	Ambient average temp stored at half month - 35	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	251	0	Records
USER DATA	Ambient average temp stored at half month - 34	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	252	0	Records
USER DATA	Ambient average temp stored at half month - 33	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	253	0	Records
USER DATA	Ambient average temp stored at half month - 32	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	254	0	Records
USER DATA	Ambient average temp stored at half month - 31	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	255	0	Records
USER DATA	Ambient average temp stored at half month - 30	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	256	0	Records
USER DATA	Ambient average temp stored at half month - 29	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	257	0	Records
USER DATA	Ambient average temp stored at half month - 28	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	258	0	Records
USER DATA	Ambient average temp stored at half month - 27	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	259	0	Records
USER DATA	Ambient average temp stored at half month - 26	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	260	0	Records
USER DATA	Ambient average temp stored at half month - 25	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	261	0	Records
USER DATA	Ambient average temp stored at half month - 24	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	262	0	Records
USER DATA	Ambient average temp stored at half month - 23	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	263	0	Records
USER DATA	Ambient average temp stored at half month - 22	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	264	0	Records
USER DATA	Ambient average temp stored at half month - 21	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	265	0	Records
USER DATA	Ambient average temp stored at half month - 20	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	266	0	Records
USER DATA	Ambient average temp stored at half month - 19	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	267	0	Records
USER DATA	Ambient average temp stored at half month - 18	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	268	0	Records
USER DATA	Ambient average temp stored at half month - 17	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	269	0	Records
USER DATA	Ambient average temp stored at half month - 16	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	270	0	Records
USER DATA	Ambient average temp stored at half month - 15	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	271	0	Records
USER DATA	Ambient average temp stored at half month - 14	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	272	0	Records
USER DATA	Ambient average temp stored at half month - 13	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	273	0	Records
USER DATA	Ambient average temp stored at half month - 12	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	274	0	Records
USER DATA	Ambient average temp stored at half month - 11	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	275	0	Records
USER DATA	Ambient average temp stored at half month - 10	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	276	0	Records
USER DATA	Ambient average temp stored at half month - 9	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	277	0	Records
USER DATA	Ambient average temp stored at half month - 8	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	278	0	Records
USER DATA	Ambient average temp stored at half month - 7	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	279	0	Records
USER DATA	Ambient average temp stored at half month - 6	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	280	0	Records
USER DATA	Ambient average temp stored at half month - 5	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	281	0	Records
USER DATA	Ambient average temp stored at half month - 4	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	282	0	Records
USER DATA	Ambient average temp stored at half month - 3	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	283	0	Records
USER DATA	Ambient average temp stored at half month - 2	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	284	0	Records
USER DATA	Ambient average temp stored at half month - 1	xx xx	2	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	285	0	Records
END	More records in next telegram	mo	1			Start of manufacturer specific data	ManufacturerDataBlock					
END	Check Sum	cs	1									
END	Stop	16	1									

Max frame size: 182 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

SND-NR (wM-Bus)

	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	<MbusRecord> XML attributes (Tools Supercom) Name	SubUnit	Tariff	Storage	FunctionE	Origin
DLL	Start, Length	Lw	1			L Field						
	Control	44 | 46	1			C Field						
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Radio serial number	xx xx xx xx	4	A, 32 bits		Unchangeable	IdentificationNumber					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
APL	CI Field	7A	1			Variable structure response (short header = 4 bytes)						
	Access number	xx	1	C, 8 bits		Transmission counter	AccessNumber					Header
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
	AES verification	2F 2F	2		🔒	Encryption verification	IdleFiller					
	Current date & time	04,6D,xx xx xx xx	6	F, 32 bits	🔒		DateAndTime	0	0	0	0	Records
	Totalizer of heating	03,6E,xx xx xx	5	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	0	0	
	Set day	42,6C,xx xx	4	G, 16 bits	🔒		Date	0	0	1	0	
	Totalizer stored at set day	43,6E,xx xx xx	5	B, 24 bits	🔒		HeatCostAllocator	0	0	1	0	
	Radiator maximum temperature of previous period	52,59,xx xx	4	B, 16 bits	🔒		FlowTemperature	0	0	1	1	
	Date stored at month - 18	82 88 01,6C,x1 xx	6	G, 16 bits	🔒		Date	0	0	48	0	
	Units stored at month - 18	83 88 01,6E,xx xx xx	7	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	48	0	
	Units compact profile	8D 88 01,EE 1E,35,33 FE	8	LVAR	🔒		HeatCostAllocator_CompactProfileWithRegisters	0	0	48	0	
	Units stored at month - 17	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	49	0	
	Units stored at month - 16	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	50	0	
	Units stored at month - 15	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	51	0	
	Units stored at month - 14	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	52	0	
	Units stored at month - 13	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	53	0	
	Units stored at month - 12	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	54	0	
	Units stored at month - 11	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	55	0	
	Units stored at month - 10	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	56	0	
	Units stored at month - 9	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	57	0	
	Units stored at month - 8	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	58	0	
	Units stored at month - 7	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	59	0	
	Units stored at month - 6	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	60	0	
	Units stored at month - 5	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	61	0	
	Units stored at month - 4	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	62	0	
	Units stored at month - 3	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	63	0	
	Units stored at month - 2	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	64	0	
	Units stored at month - 1	xx xx xx	3	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	65	0	
	Units factor kC	05,FF 2D,xx xx xx xx	7	H, 32 bits	🔒	§ dimensionless value	Coefficient	0	0	0	0	
	Units factor kQ	85 20,FF 2D,xx xx xx xx	8	H, 32 bits	🔒	§ dimensionless value	Coefficient	0	2	0	0	
	Radiator temperature	02,59,xx xx	4	B, 16 bits	🔒	[1/100 °C]	FlowTemperature	0	0	0	0	
	Ambient temperature	02,65,xx xx	4	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	0	0	
	Radiator maximum temperature of current period	12,59,xx xx	4	B, 16 bits	🔒	[1/100 °C]	FlowTemperature	0	0	0	1	
	Fraud duration	83 10,FD 31,xx xx xx	7	B, 24 bits	🔒	[min]	DurationOfTariff	0	1	0	0	
	Date of the last fraud	82 10,6C,xx xx	5	G, 16 bits	🔒		Date	0	1	0	0	
	Fraud counter	81 10,FD 61,xx	5	C, 8 bits	🔒		CumulationCounter	0	1	0	0	
	Commissioning date	82 20,6C,xx xx	5	G, 16 bits	🔒		Date	0	2	0	0	
	Internal version	0B,FD 0F,xx xx xx	6	A, 24 bits	🔒		OtherSoftwareVersion	0	0	0	0	
	Flags error	02,FF 2C,fg fg	5	D, 16 bits	🔒	§	ManufacturerErrorFlags	0	0	0	0	
	State of parameters	02,FD 66,pp pp	5	D, 16 bits	🔒		StateOfParameterActivation	0	0	0	0	
	Fill AES	2F 2F 2F 2F 2F 2F 2F 2F 2F 2F 2F 2F	13		🔒		IdleFiller					
	Total		191 bytes									

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

SND-NR (wM-Bus)

							<MbusRecord> XML attributes (Tools Supercom)					
	Field	Frame bytes in hex (Note 1)	Bytes	Coding		Comment	Name	SubUnit	Tariff	Storage	Function‡	Origin
DLL	Start, Length	Lw	1			L Field						
	Control	44 | 46	1			C Field						
	Manufacturer ID	EE 4D	2	C, 16 bits		"SON"	Manufacturer					
	Radio serial number	xx xx xx xx	4	A, 32 bits		Unchangeable	IdentificationNumber					
	Version of meter	16	1	C, 8 bits			Version					
	Device type	08	1	D, 8 bits		Heat cost allocator	DeviceType					
APL	CI Field	7A	1			Variable structure response (short header = 4 bytes)						
	Access number	xx	1	C, 8 bits		Transmission counter	AccessNumber					Header
	Status	st	1	Ds, 8 bits			Status					
	Config word	00 00	2	C, 16 bits			Signature					
	AES verification	2F 2F	2		🔒	Encryption verification	IdleFiller					
	Current date & time	04,6D,xx xx xx xx	6	F, 32 bits	🔒		DateAndTime	0	0	0	0	Records
	Totalizer of heating	03,6E,xx xx xx	5	B, 24 bits	🔒	dimensionless	HeatCostAllocator	0	0	0	0	
	Set day	42,6C,xx xx	4	G, 16 bits	🔒		Date	0	0	1	0	
	Totalizer stored at set day	43,6E,xx xx xx	5	B, 24 bits	🔒		HeatCostAllocator	0	0	1	0	
	Flags error	02,FF 2C,fg,fg	5	D, 16 bits	🔒	§	ManufacturerErrorFlags	0	0	0	0	
	Radiator temperature	02,59,xx xx	4	B, 16 bits	🔒	[1/100 °C]	FlowTemperature	0	0	0	0	
	Ambient temperature	02,65,xx xx	4	B, 16 bits	🔒	[1/100 °C]	ExternalTemperature	0	0	0	0	
	State of parameters	02,FD 66,pp pp	5	D, 16 bits	🔒		StateOfParameterActivation	0	0	0	0	
	Fill AES	2F 2F 2F 2F 2F 2F 2F 2F	8		🔒		IdleFiller					
	Total		63	bytes								

Symbols

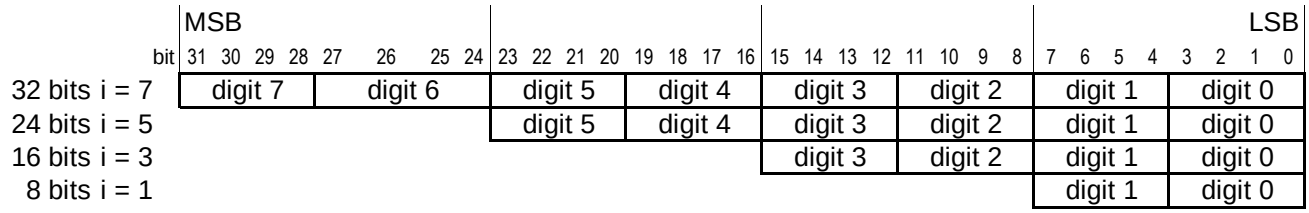
‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

§ manufacturer specific VIFE

Notes

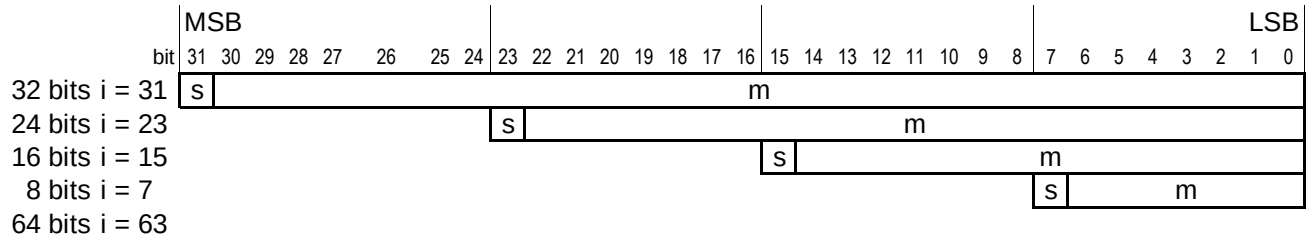
1. For non hexadecimal or lower case digits see the detailled description in the Keys sheet.

Type A Unsigned integer BCD



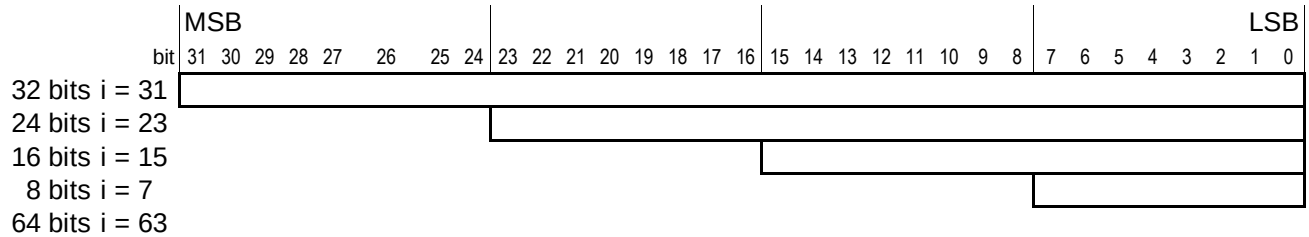
bit[x] : 0, 1
digit[x] : 0 .. 9
digit[x] = bit[x*4+3]*2^3 + bit[x*4+2]*2^2 + bit[x*4+1]*2^1 + bit[x*4+0]*2^0
number = digit[i]*10^i + digit[i-1]*10^(i-1) + digit[i-2]*10^(i-2) + ... + digit[0]*10^0
range : 0 .. 10^(i+1)-1

Type B Binary integer



bit[x] : 0, 1
m = bit[i-1]*2^(i-1) + bit[i-2]*2^(i-2) + ... + bit[0]*2^0
Sign : 0=positive, 1=negative
If Sign(bit[i]) = positive Then number = m
If Sign(bit[i]) = negative Then number = m - 2^i
range : -2^i .. +(2^i)-1

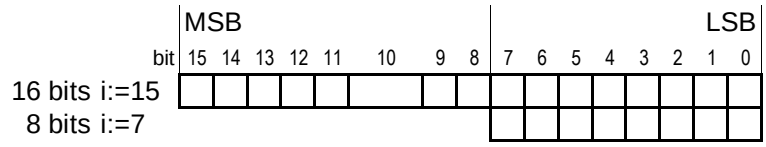
Type C Unsigned integer



bit[x] : 0, 1
number = bit[i]*2^i + bit[i-1]*2^(i-1) + bit[i-2]*2^(i-2) + ... + bit[0]*2^0
range : 0 .. +2^(i+1)-1

Type D

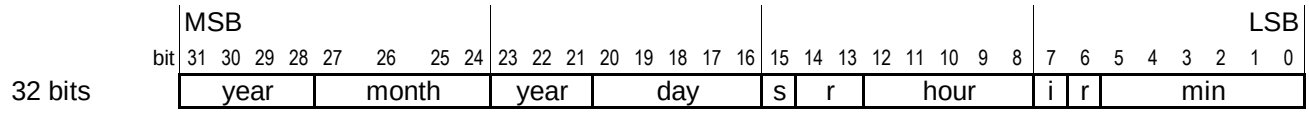
Array of Boolean



bit[x] : 0, 1
Boolean : 0=false, 1=true
Flag[i] = Boolean(bit[i])
Flag[i-1] = Boolean(bit[i-1])
...
Flag[0] = Boolean(bit[0])

Type F

Date and Time



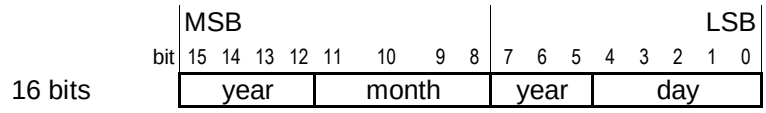
bit[x] : 0, 1

min : 0 .. 59	min = bit[5]*2^5 + ... + bit[0]*2^0
hour : 0 .. 23	hour = bit[12]*2^4 + ... + bit[8]*2^0
day : 1 .. 31	day = bit[20]*2^4 + ... + bit[16]*2^0
month : 1 .. 12	month = bit[27]*2^3 + ... + bit[24]*2^0
year : 0 .. 99	year = bit[31]*2^6 + ... + bit[28]*2^3 + bit[23]*2^2 + ... + bit[21]*2^0

s : standard time (bit[15]=0), summer time (bit[15]=1)
i : valid (bit[7]=0), invalid (bit[7]=1)
r : reserved (bit[6],bit[13],bit[14] are always 0)

Type G

Date

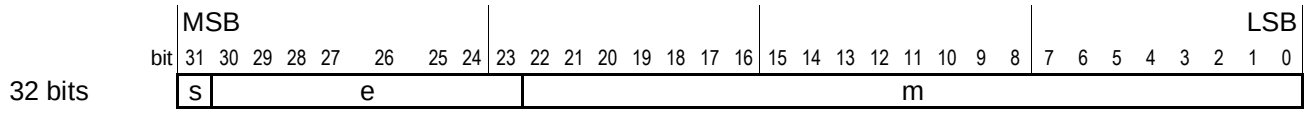


bit[x] : 0, 1

day : 1 .. 31	day = bit[4]*2^4 + ... + bit[0]*2^0
month : 1 .. 12	month = bit[11]*2^3 + ... + bit[8]*2^0
year : 0 .. 99	year = bit[15]*2^6 + ... + bit[12]*2^3 + bit[7]*2^2 + ... + bit[5]*2^0

Type H

Floating point (IEEE STD 754)

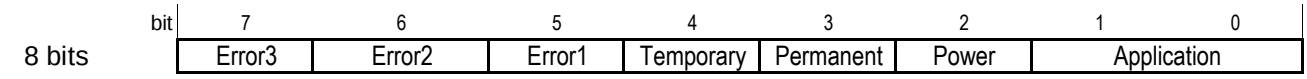


bit[x] : 0, 1
m = bit[22]*2^-1 + bit[21]*2^-2 + ... + bit[0]*2^-23
e = bit[30]*2^7 + bit[29]*2^6 + ... + bit[23]*2^0
s = -1^bit[31]

If (e>0) AND (e<255)	Then number = s * 2^(e-127) * (1 + m)
If (e=0) AND (m<>0)	Then number = s * 2^(e-126) * m
If (e=0) AND (m=0)	Then number = s * 0
If (e=255) AND (m=0)	Then number = s * infinite
If (e=255) AND (m<>0)	Then number = not a number

Type Ds

Status, array of boolean



bit[x] : 0, 1
Application = bit[1]*2^1 + bit[0]*2^0
Application : 0=no error, 1=busy, 2=error, 3=reserved
Power : 1=power low
Permanent : 1=permanent error
Temporary : 1=temporary error
Error1 : 1=flow measurement error (specific Sontex 739)
Error2 : 1=temperature measurement error (specific Sontex 739)